

Apprenticeship and Workplace Mathematics 10

Module 3 Blackline Masters

This blackline master package, which includes all section assignments, as well as selected worksheets, activities, and other materials for teachers to make their own overhead transparencies or photocopies, is designed to accompany Open School BC's **AWM 10** course. BC teachers, instructional designers, graphic artists, and multimedia experts developed the course and blackline masters.

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Module 3

Section 1—Lesson A: Sketching and Measuring Angles

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
How can you sketch and describe angles of various measures?			
How are referents used to estimate the measure of a given angle?			
How is the protractor used to measure angles in a variety of orientations?			

Module 3

Section 1—Lesson B: Constructing Congruent Angles

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
How can you determine if two angles are congruent?			
How can you construct congruent angles?			

Module 3

Section 1—Lesson C: Bisecting Angles

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
What does it mean to bisect an angle?			
How are different techniques used to bisect angles?			

Module 3

Section 1—Lesson D: Relationships Among Angles

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
What are some of the relationships between sets of angles?			
How can classifying the relationships between sets of angles help you solve problems?			

Module 3

Section 1—Lesson E: Parallel and Perpendicular Lines

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
What relationships exist between angles formed when a line intersects a set of two parallel lines?			
How can the relationship among angles formed when a line intersects parallel lines be used to find missing angles in geometric shapes?			

Module 3

Section 1—Lesson F: Solving Problems Using Angle Relationships

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
How are the measures of angles determined in problem situations involving parallel lines and transversals?			

Your Name: _____

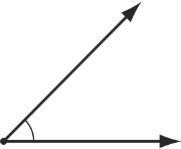
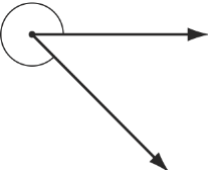
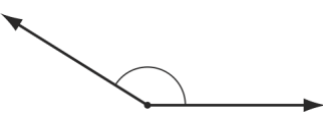
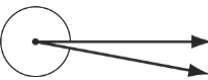
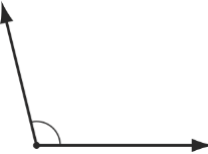
Student No. _____

Section 1 Assignment Part 1: Measuring Angles

Instructions:

Please show all your work. You may use your AWM 10 Data Pages. **(Total 18 marks)**

1. Classify each angle below as either reflex, acute, straight, obtuse, or full rotation.
(4 marks)

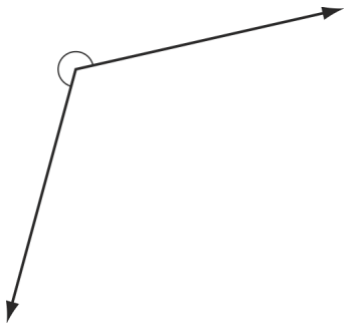
a. 	_____
b. 	_____
c. 	_____
d. 	_____
e. 	_____
f. 	_____
g. 	_____
h. 	_____

Your Name: _____

Student No. _____

2. The word *acute* means *sharp*. Do you think this is an appropriate name to describe what you know as acute angles? Why or why not? (1 mark)

3. a. Measure this angle using your protractor. (1 mark)



- b. Classify the angle. Explain your classification. (1 mark)

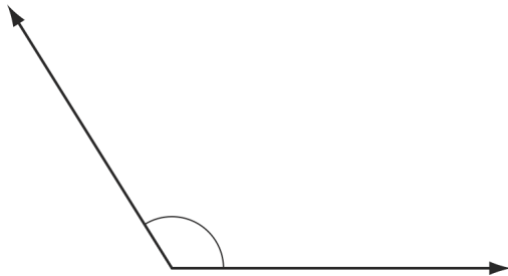
4. a. Draw an angle 231° in measure. (1 mark)

Your Name: _____

Student No. _____

- b. A student says she can draw the 231° angle in (a) by drawing a 129° angle. She says, “ 129° looks the same as 231° , except it is the other way around.” Is she right? Explain your answer. (2 marks)

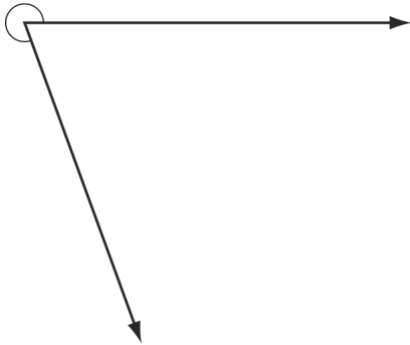
5. Estimate the measure of the following angle using the referents you created in Lesson A. Describe the referent you used and how you arrived at your estimate. (4 marks)



Your Name: _____

Student No. _____

6. Estimate the measure of this angle using the referents you created in Lesson A. Describe the referent you used and how you arrived at your estimate. (4 marks)



Your Name: _____

Student No. _____

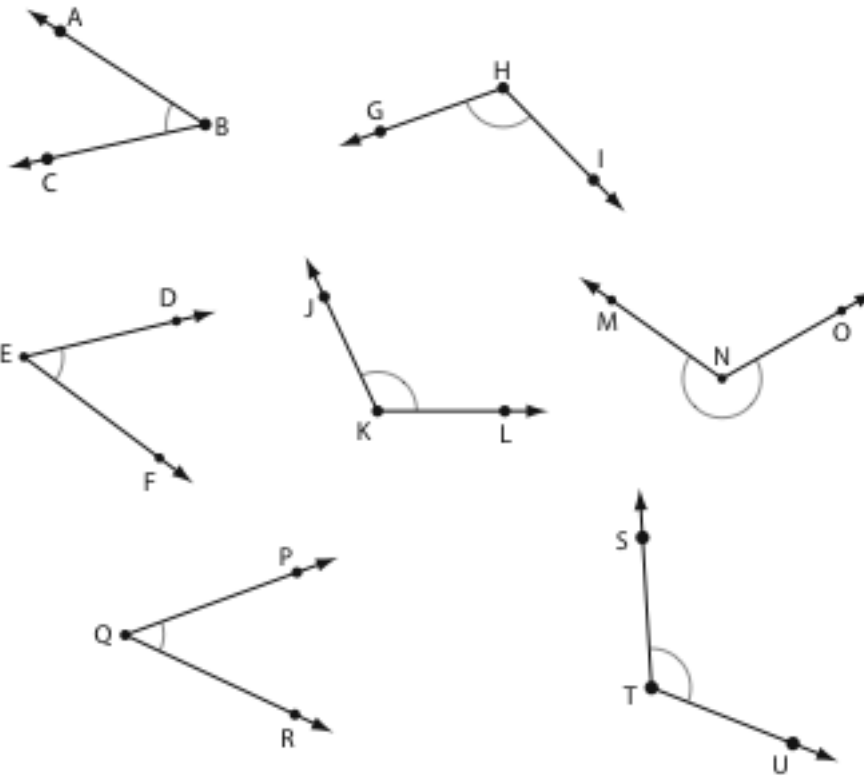
Section 1 Assignment Part 2: Congruent Angles

Instructions:

Please show all your work. You may use your AWM 10 Data Pages. **(Total 19 marks)**

1. What does it mean for two angles to be congruent? (1 mark)

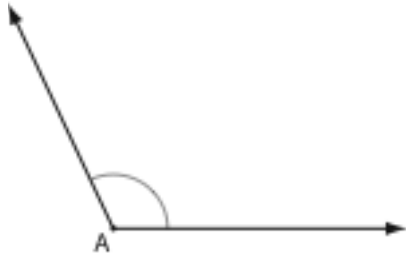
2. Look at the angles below. Use your protractor to find all the sets of congruent angles. (2 marks)



Your Name: _____

Student No. _____

3. Look at the angle below.



- a. Use your protractor to draw an angle congruent to A. (1 mark)
- b. Use the method of paper-folding describe in Lesson B to draw an angle congruent to A. (1 mark)
- c. Use your compasses and straightedge to construct an angle congruent to A. (1 mark)

Your Name: _____

Student No. _____

d. You have used different methods to construct congruent angles.

i. Which method do you prefer? Why? (2 marks)

ii. Describe one advantage and one disadvantage of each method. (6 marks)

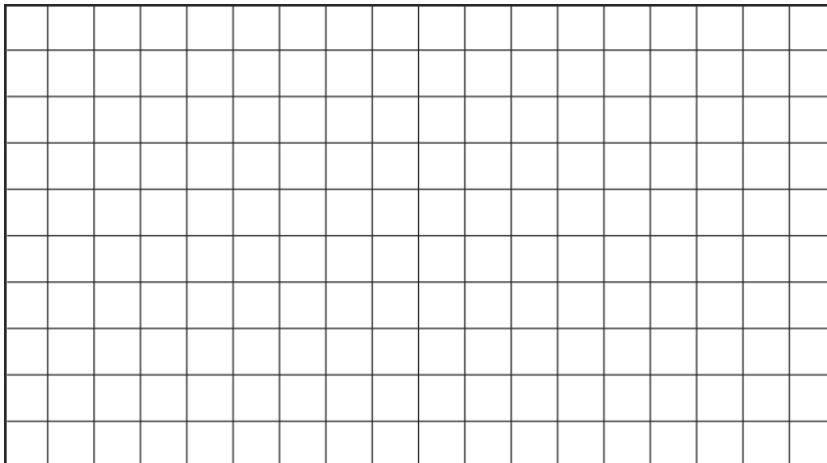
Method	Advantage	Disadvantage
1. Protractor		
2. Paper Folding		
3. Compass and Straightedge		

Your Name: _____

Student No. _____

4. Draw an angle 231° in measure. Use your compasses and straightedge to construct a second angle, congruent to the first angle. Show all the details of your construction in your diagram. (3 marks)

5. A roof rises 5 in for every 1 ft it extends outward. Use the grid below to draw an angle that is the same as the slope of the roof. What is the measure of that angle to the nearest degree? (2 marks)



Your Name: _____

Student No. _____

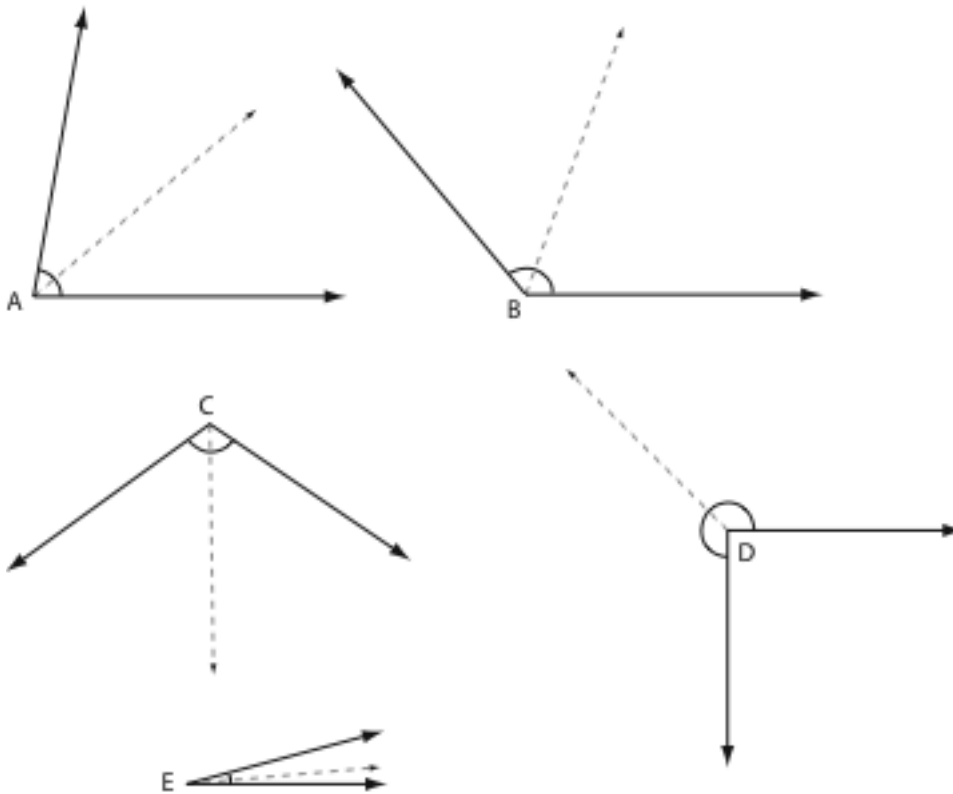
Section 1 Assignment Part 3: Bisecting Angles

Instructions:

Please show all your work. You may use your AWM 10 Data Pages. **(Total 16 marks)**

1. What does it mean to bisect an angle? (1 mark)

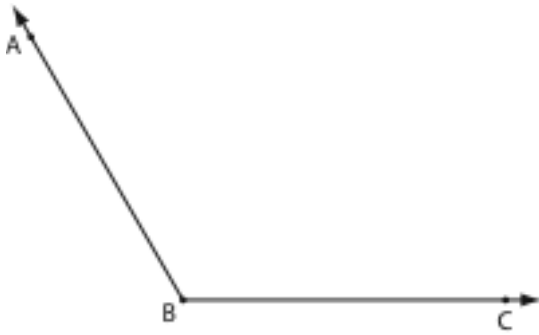
2. Look at the angles below. Use your protractor to determine which angles have been bisected. List the angles on the lines provided below. (2 marks)



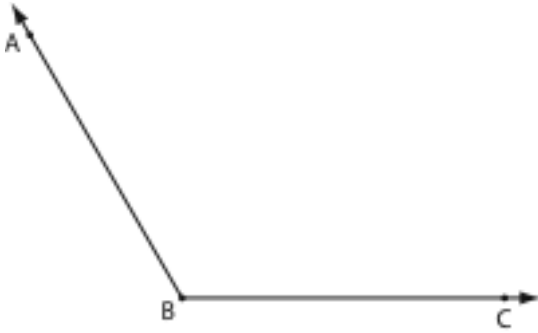
Your Name: _____

Student No. _____

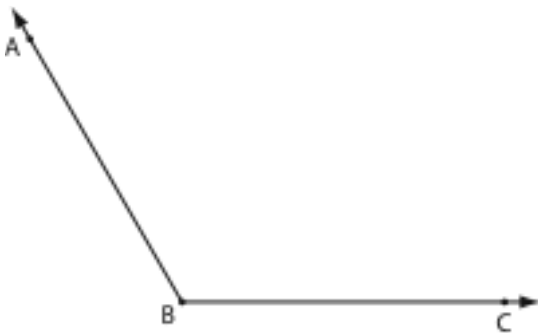
3. Look at the angle below.



a. Use your protractor to draw a ray that bisects $\angle ABC$. (2 marks)



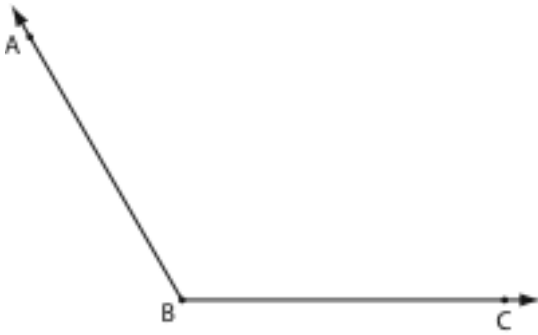
b. Use the method of paper-folding described in Lesson C to bisect $\angle ABC$. (2 marks)



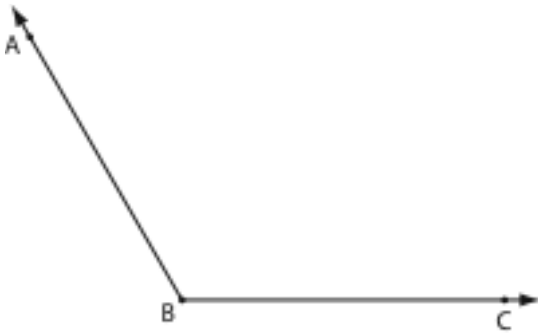
Your Name: _____

Student No. _____

c. Use your compasses and straightedge to bisect $\angle ABC$. (2 marks)



d. Use your set square to bisect $\angle ABC$. (2 marks)



e. You have used four different methods to bisect an angle.

i. Which method do you prefer? Why? (2 marks)

Your Name: _____

Student No. _____

- ii. Describe one advantage and one disadvantage of the carpenter's square method of bisecting an angle. (2 marks)

Method	Advantage	Disadvantage
Using a Square		

4. Explain how you would use your protractor to check the accuracy of the construction of an angle bisector. (1 mark)

Your Name: _____

Student No. _____

Section 1 Assignment Part 4: Angle Relationships

Instructions:

Please show all your work. You may use your AWM 10 Data Pages. **(Total 20 marks)**

1. The following photograph shows a goal stand on a soccer field.

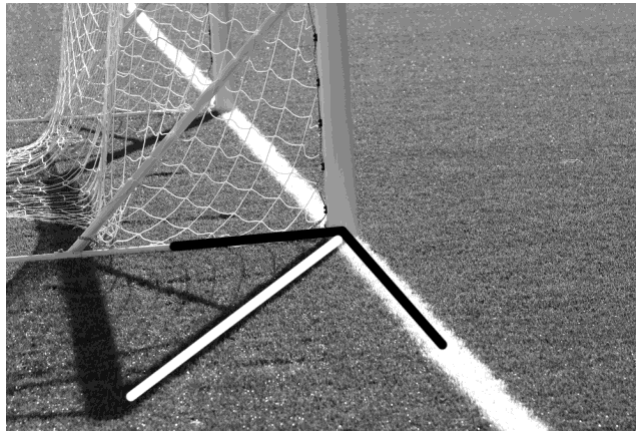


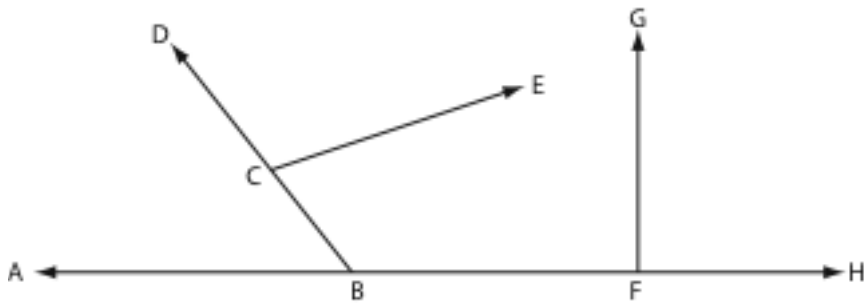
Photo by Tina Rencelj © 2010

The shadow of the closer goal post divides the right angle formed by the bottom of the goal stand and the white line into two smaller angles. What term best describes that pair of angles? Why? (1 mark)

Your Name: _____

Student No. _____

2. The rays in the following diagram form many angles.



Name 2 pairs of adjacent angles from the diagram. (2 marks)

3. The following angles are shown with their measures.



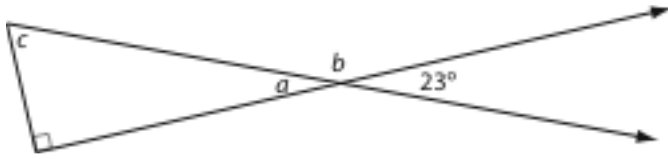
Name the two angles which are:

- a. Supplementary (1 mark) _____ and _____
- b. Complementary (1 mark) _____ and _____

Your Name: _____

Student No. _____

4. In the diagram of a right triangle, the hypotenuse and one side is extended.

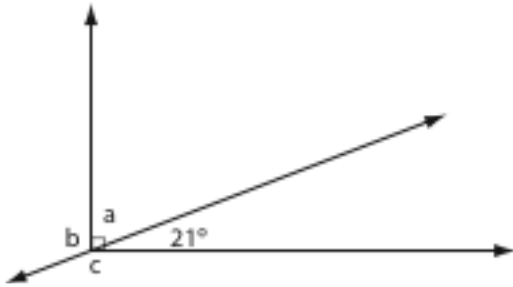


Determine the values of a , b , and c . State the angle relationship you used to obtain your answer in each instance. (5 marks)

Your Name: _____

Student No. _____

5. This illustration shows a line passing through the vertex of a right triangle.

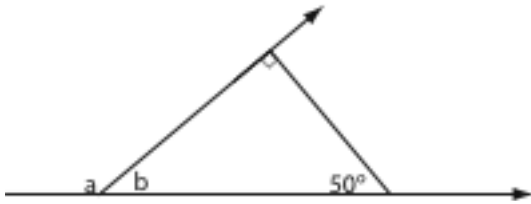


Determine the values of a , b , and c . State the angle relationship you used to obtain your answer in each instance. (6 marks)

Your Name: _____

Student No. _____

6. The following figure is a right triangle with two of its sides extended. Several angles are identified.



Determine the value of a . State the angle relationship you used to obtain your answer. (4 marks)

Your Name: _____

Student No. _____

Section 1 Assignment Part 5: Parallel and Perpendicular Lines

Instructions:

Please show all your work. You may use your AWM 10 Data Pages. **(Total 21 marks)**

1. a. How many sets of parallel lines are there in a cube? How many lines are there in each set? Support your answer with a diagram. (2 marks)

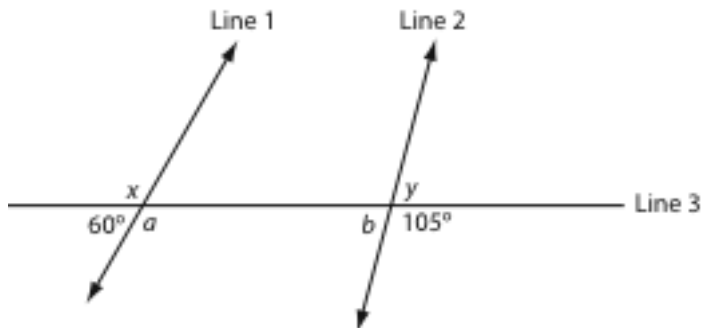
- b. In a cube where do perpendicular lines occur? How many perpendicular lines are there at those locations? (2 marks)

- c. From your answers to (a) and (b), what can you say about the faces of a cube? Explain your answer. (2 marks)

Your Name: _____

Student No. _____

2. This illustration shows a horizontal line segment labelled Line 3. It is crossed by two lines labelled Line 1 and Line 2.



You can make several inferences from the diagram.

- a. What term best describes Line 3? (1 mark)

- b. What term best describes the angles marked x and y ? (1 mark)

- c. What term best describes the angles marked a and b ? (1 mark)

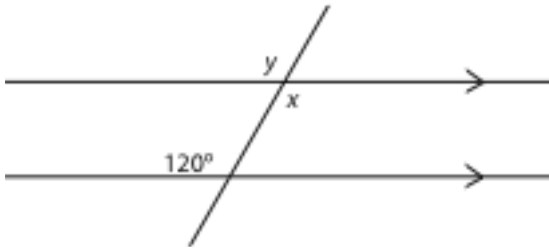
- d. What term best describes the angles a and x ? (1 mark)

- e. Are Line 1 and Line 2 parallel? Justify your answer. (2 marks)

Your Name: _____

Student No. _____

3. Look at the diagram below.

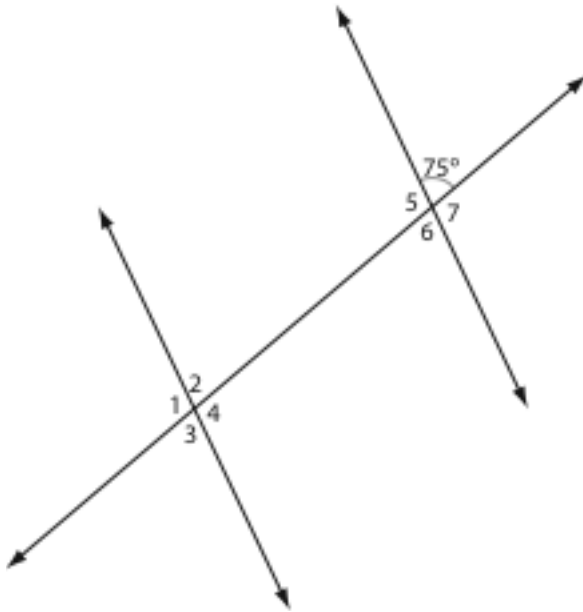


Determine the values of x and y . State the angle relationship you used to obtain your answer in each instance. (2 marks)

Your Name: _____

Student No. _____

4. Look at the diagram below.



Determine all of the missing angle measures. State the angle relationship you used to obtain each answer. (7 marks)

Angle Measures	Relationship
1 = _____ °	
2 = _____ °	
3 = _____ °	
4 = _____ °	
5 = _____ °	
6 = _____ °	
7 = _____ °	

Your Name: _____

Student No. _____

Section 1 Assignment Part 6: Solving Problems Using Angle Relationships

Instructions:

Please show all your work. You may use your AWM 10 Data Pages. **(Total 16 marks)**

1. A puck is shot in a straight line across the centre red line and the blue line as shown.

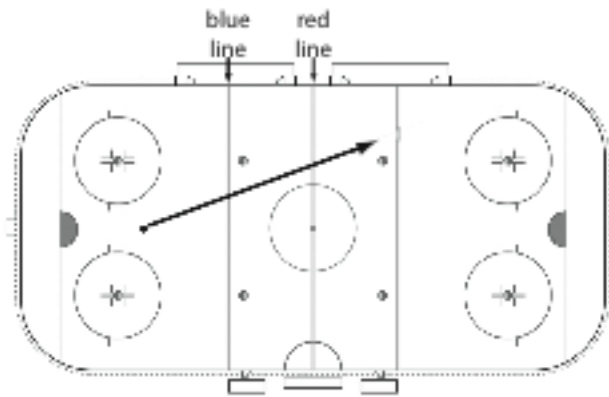


Photo by Jecowa © 2010

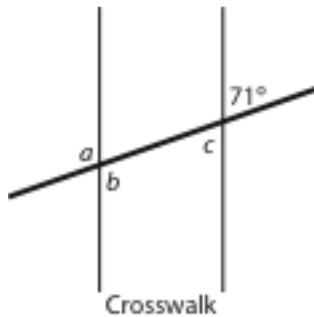
- a. What is the relationship between the set of angles formed by the puck's line of motion across the red line and the blue line? (1 mark)

- b. The red centre line and the blue lines are parallel. How could you check to see if they are parallel by measuring angles they form along the boards? (2 marks)

Your Name: _____

Student No. _____

2. A motorcyclist braked to avoid an accident. The skid mark he left was a straight line across a marked crosswalk with parallel sides. Calculate the values of a , b , and c . In each instance, identify the angle relationship you used. (6 marks)



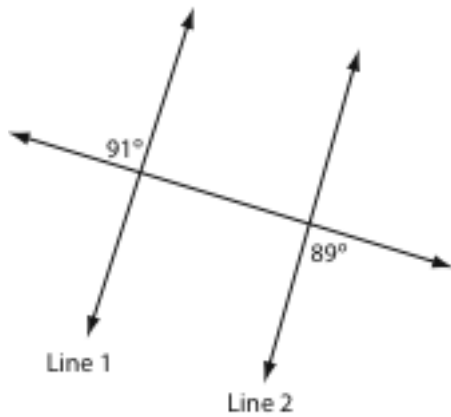
3. ABCD is a parallelogram. $\angle A = 63^\circ$. Find the measure of $\angle B$. State the angle relationship you used. (2 marks)



Your Name: _____

Student No. _____

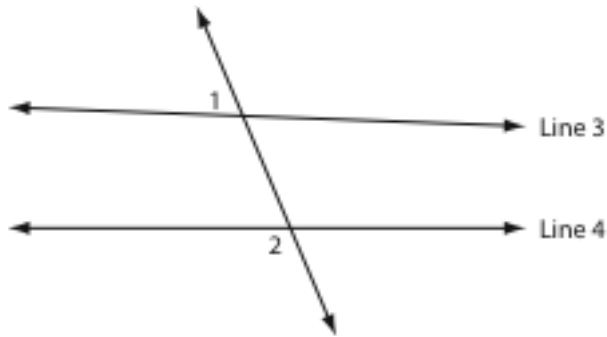
4. In the following figure, are Line 1 and Line 2 parallel? Justify your answer.
(2 marks)



Your Name: _____

Student No. _____

5. In the diagram below, Line 3 and Line 4 are not parallel.



- a. If $\angle 1 = 44^\circ$, what measure could $\angle 2$ be? Justify your answer. (2 marks)

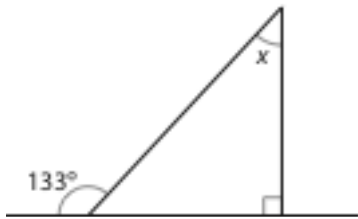
- b. What is the name for the angle pair made up of $\angle 1$ and $\angle 2$? (1 mark)

Section 1 Assignment Part 7: Multiple Choice Section Review

Instructions:

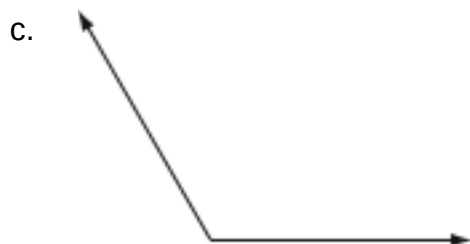
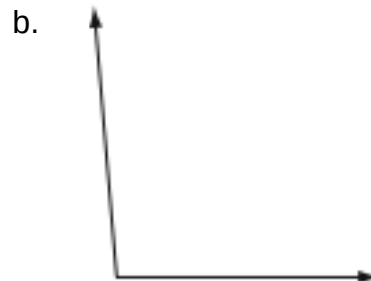
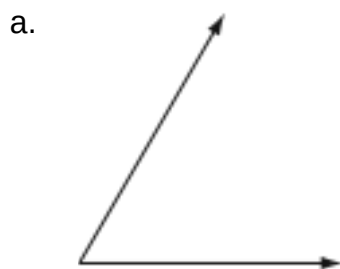
Please complete without a protractor. Please complete the first five questions without a calculator. You may use your AWM 10 Data Pages. Each question is worth 1 mark.
(Total 15 marks)

1. What is the measure of angle x in the diagram below?

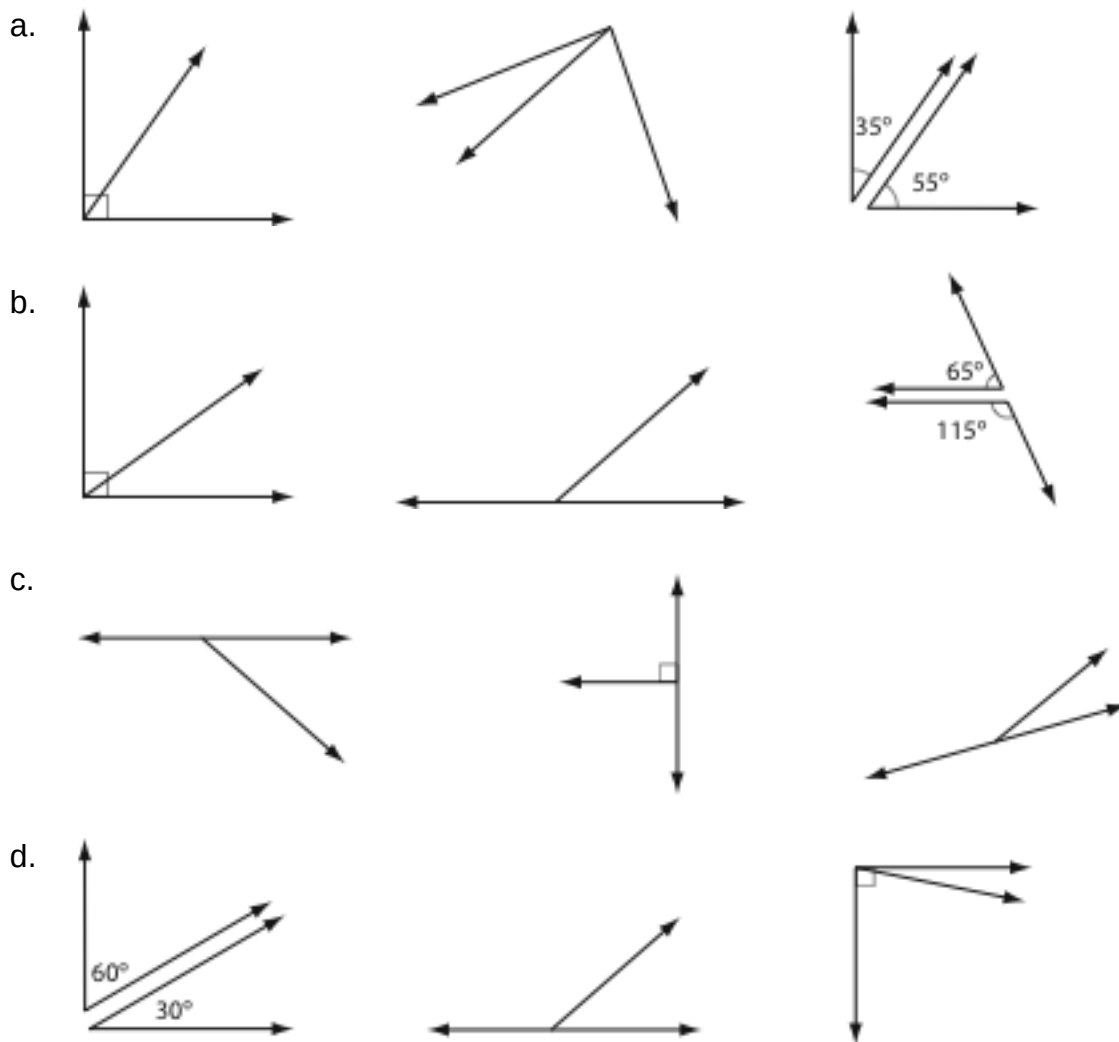


- a. 37°
- b. 43°
- c. 47°
- d. 137°

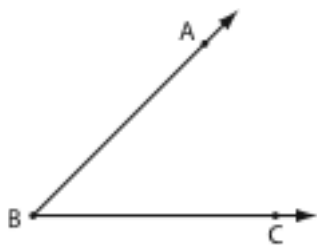
2. Which angle drawn below measures approximately 120° ?



3. Which set of diagrams shows two examples of complementary angles and one example of supplementary angles?



4. Estimate the measure of $\angle ABC$. Note: this diagram is drawn to scale.

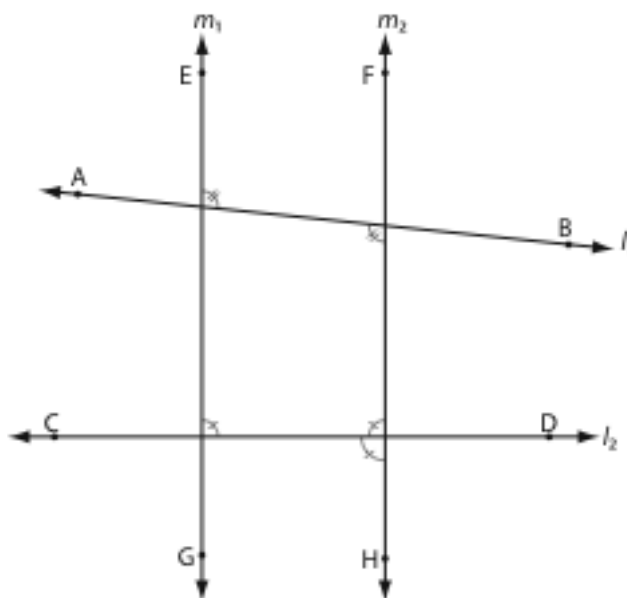


- a. 22.5°

- b. 30°
- c. 45°
- d. 60°

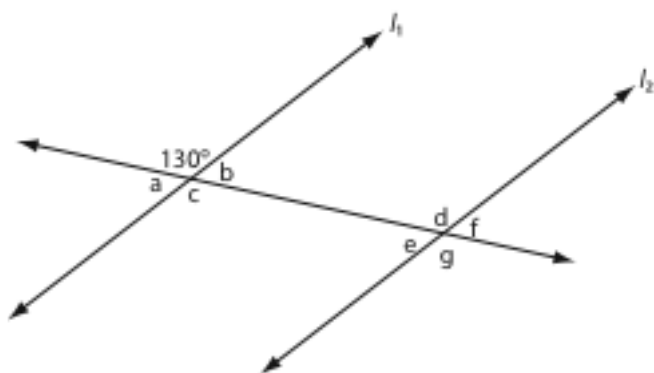
5. In this diagram, which line is:

- i. perpendicular to m_1 ?
 - ii. parallel to m_1 ?
- | | | |
|----|----------|-----------|
| a. | i. none | ii. m_2 |
| b. | i. none | ii. none |
| c. | i. l_2 | ii. m_2 |
| d. | i. m_2 | ii. none |



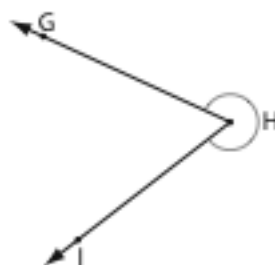
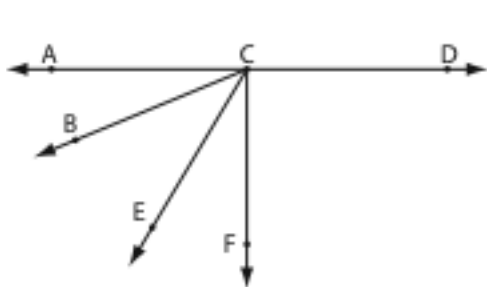
You may use a calculator for the remaining questions if you need one.

6. Jeff attempted to complete a half rotation in the air while snowboarding. He managed to turn 80° . In degrees, how much more did Jeff need to turn to complete the half rotation?
- a. 10°
 - b. 20°
 - c. 100°
 - d. 280°
7. Which angles measure 50° in the diagram below?



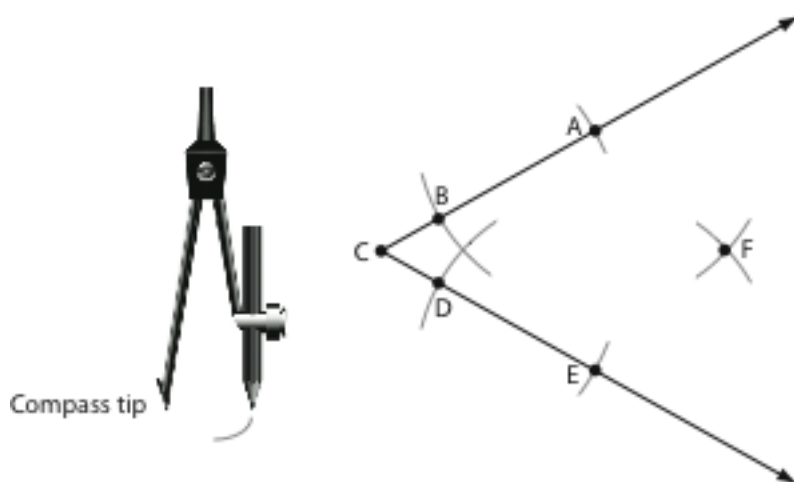
- a. a and b only
- b. d and g only
- c. e and f only
- d. a , b , e and f only

8. Identify an acute angle, an obtuse angle, and a reflex angle from the diagrams below.



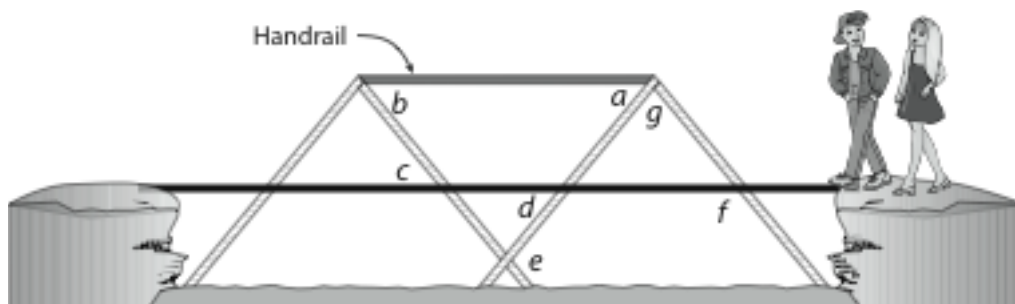
	Acute	Obtuse	Reflex
a.	ACE	GHI	ACD
b.	ACE	DCF	DCB
c.	BCE	ACD	GHI
d.	BCE	DCB	GHI

9. To bisect $\angle ACE$, in what order would a compass tip touch the points?



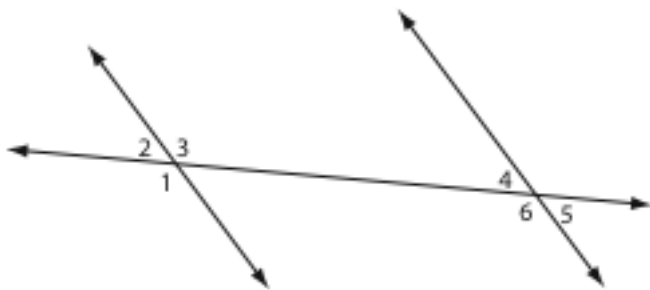
- a. A, F, E
- b. B, A, F
- c. C, A, E
- d. C, A, D

10. A footbridge is supported by diagonal braces that form a handrail as shown below. Which pair of angles could be compared to determine if the rail is parallel to the bridge deck?



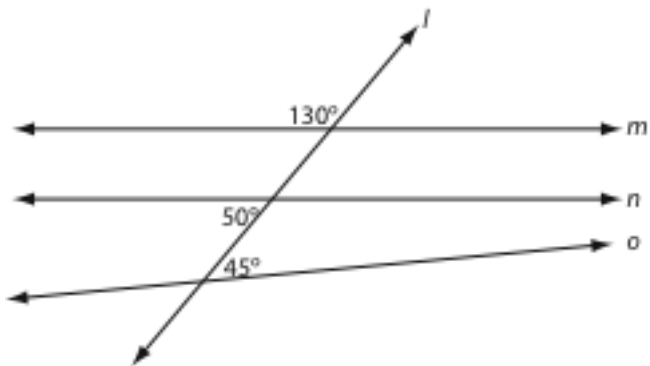
- a. a and d
- b. c and d
- c. e and g
- d. b and e

11. Which choice has two true statements about the diagram below?



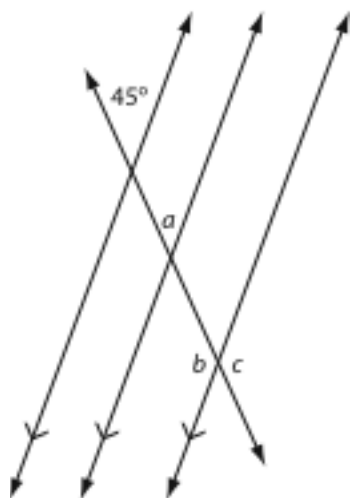
- a. $1 \cong 3$
3 and 5 are corresponding angles
- b. 4 and 5 are supplementary angles
there are two transversals and one parallel line
- c. $2 \cong 5$
3 and 4 are adjacent angles
- d. 3 and 6 are alternate interior angles
2 and 3 are supplementary angles

12. In the diagram below, which lines are parallel?



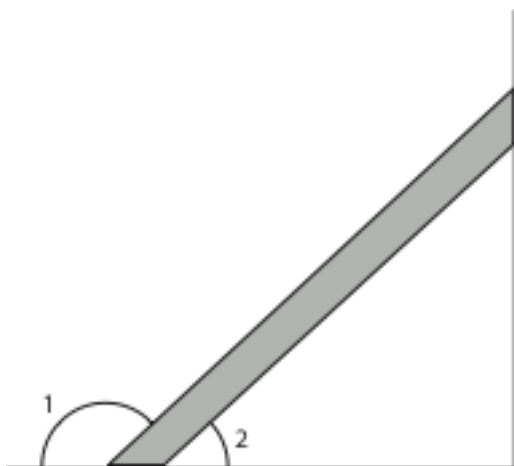
- a. $m \parallel o$ only
- b. $m \parallel n$ only
- c. $m \parallel n \parallel o$
- d. no parallel lines

13. In the diagram below, what are the measures of a , b , and c ?



- a. $a = 135^\circ$, $b = 45^\circ$, $c = 45^\circ$
- b. $a = 45^\circ$, $b = 90^\circ$, $c = 90^\circ$
- c. $a = 135^\circ$, $b = 135^\circ$, $c = 45^\circ$
- d. $a = 45^\circ$, $b = 135^\circ$, $c = 135^\circ$

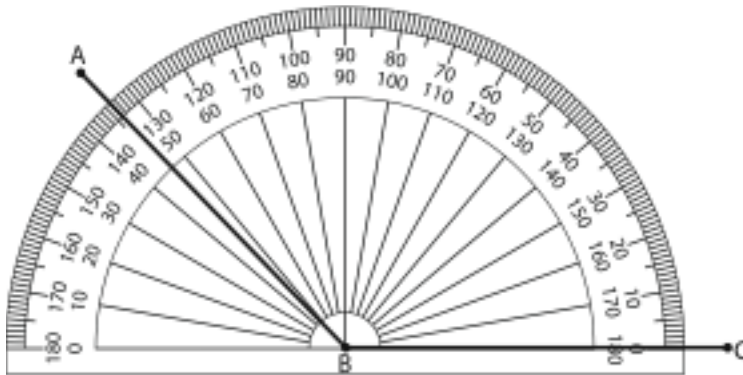
14. In the diagram below, the wall is supported by a brace cut from two-by-four lumber.



What is the relationship between $\angle 1$ and $\angle 2$?

- a. alternate exterior angles
- b. co-exterior angles
- c. corresponding angles
- d. complementary angles

15. What is the measure of $\angle ABC$ using the protractor shown below?



- a. 46°
- b. 54°
- c. 134°
- d. 146°

Module 3

Section 2—Lesson A: Similar Polygons

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
What techniques can be used to draw similar polygons?			
What are the relationships among the sides of similar polygons?			
What are the relationships among angles of similar polygons?			

Module 3

Section 2—Lesson B: Ratios and Similar Polygons

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
How can you determine if two polygons are similar?			
How are the relationships among the sides and angles of similar polygons used to solve problems?			

Module 3

Section 2—Lesson C: Similar Triangles

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
How can you identify similar triangles?			
How can you use the relationships among similar triangles to solve problem situations?			

Module 3

Section 2—Lesson D: Applying Similar Triangles

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
How are the measures of relationships among similar right triangles used in problem solving?			

Module 3

Section 2—Lesson E: Pythagorean Theorem

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
What is the Pythagorean Theorem?			
How can you verify the Pythagorean Theorem?			

Module 3

Section 2—Lesson F: Applying the Pythagorean Theorem

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
How is the Pythagorean Theorem applied to solve a variety of practical problem situations?			

Your Name: _____

Student No. _____

Section 2 Assignment Part 1: Similar Polygons

Instructions:

Please show all your work. You may use your AWM 10 Data Pages. **(Total 17 marks)**

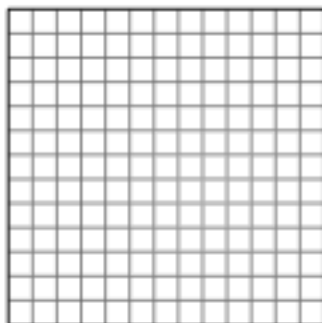
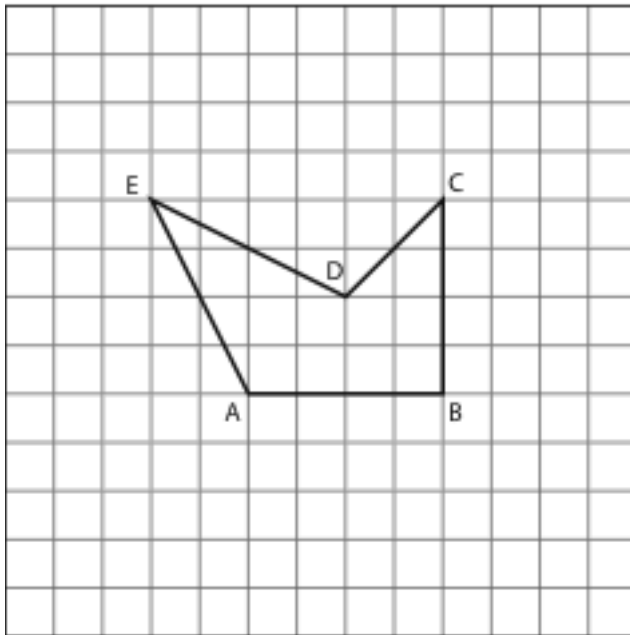
1. What does it mean to say that two shapes are similar? (2 marks)

2. What is a proportion? (1 mark)

Your Name: _____

Student No. _____

3. Redraw the following shape on the blank grid provided and label your shape $A'B'C'D'$. Then answer the questions that follow.



(1 mark)

- a. Record the measures to the nearest degree of the angles on ABCD and $A'B'C'D'$. Compare the measures of the corresponding angles. Is the result what you expected? If it is, explain why it is. If it is not, explain why it may differ from what you expected. (3 marks)

Your Name: _____

Student No. _____

- b. Measure each side length to the nearest millimeter. Complete the following ratios. When determining the value of the ratios, round to the nearest whole number. (5 marks)

$$\frac{AB}{A'B'} =$$

$$\frac{BC}{B'C'} =$$

$$\frac{CD}{C'D'} =$$

$$\frac{DE}{D'E'} =$$

$$\frac{EA}{E'A'} =$$

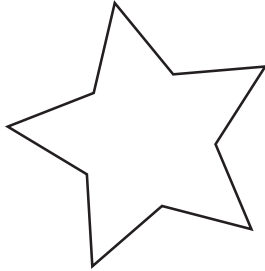
- c. Is the result in (b) what you expected? If it is, explain why it is. If it is not, explain why it may differ from what you expected. (1 mark)

Your Name: _____

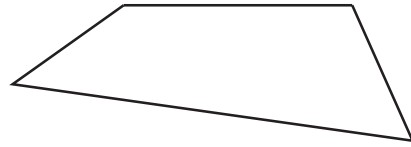
Student No. _____

4. Match each shape on the left with its similar shape on the right. You may use a protractor and/or a ruler. (4 marks)

1. _____



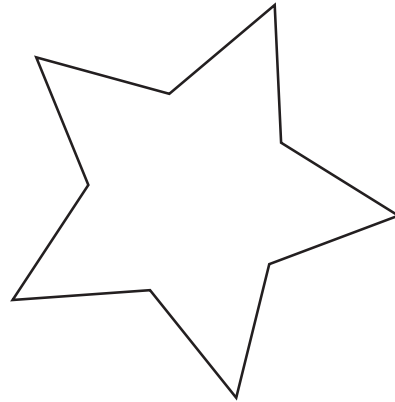
A.



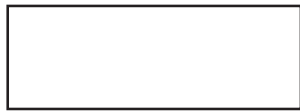
B.



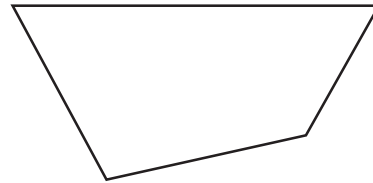
C.



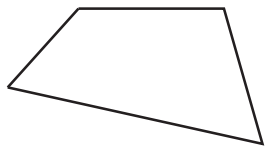
2. _____



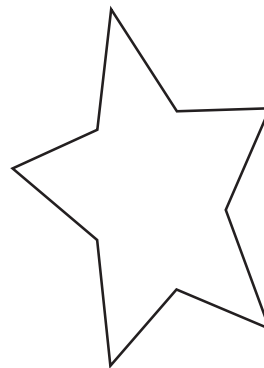
D.



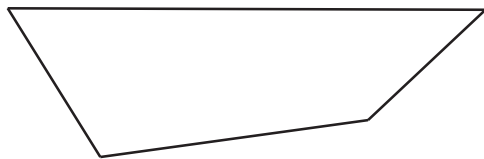
3. _____



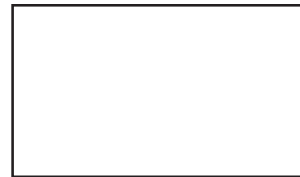
E.



4. _____



F.



Your Name: _____

Student No. _____

Section 2 Assignment Part 2: Ratios and Similar Polygons

Instructions:

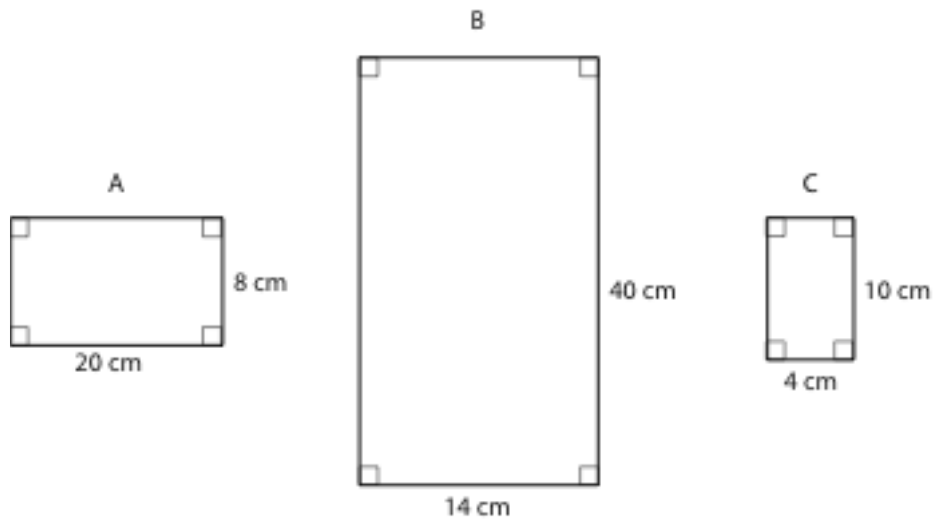
Please show all your work. You may use your AWM 10 Data Pages. **(Total 16 marks)**

1. A series of nested dolls are similar figures. If the tallest doll is 10 cm, and the scale factor is $\frac{4}{5}$, what is the height of the next tallest doll? (2 marks)

Your Name: _____

Student No. _____

2. The following are all rectangles.

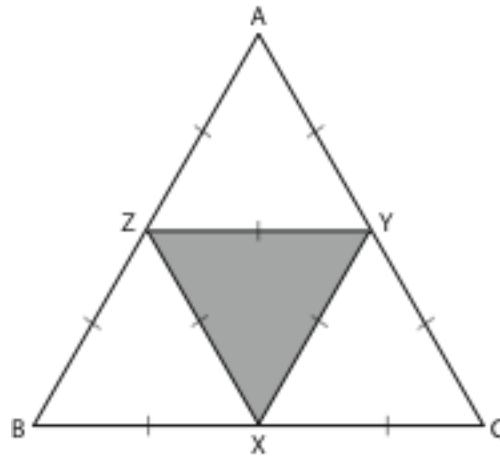


Which of these figures are similar? Justify your answer. (2 marks)

Your Name: _____

Student No. _____

3. In the following figure, the large equilateral triangle is divided into smaller congruent equilateral triangles.



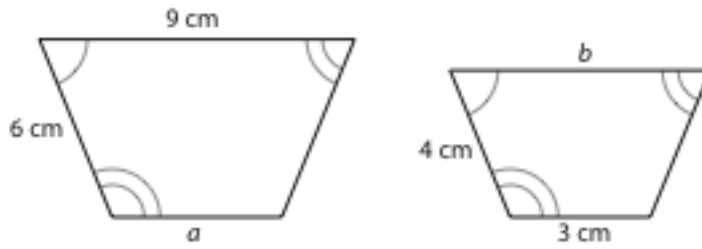
- a. Are $\triangle ABC$ and $\triangle XYZ$ similar polygons? Why or why not? (2 marks)

- b. What scale factor would you use to reduce $\triangle ABC$ to $\triangle XYZ$? What is the relationship between their areas? (2 marks)

Your Name: _____

Student No. _____

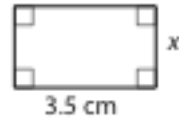
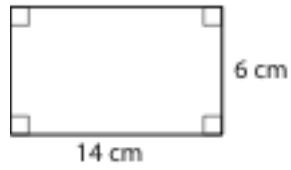
4. If the following polygons are similar, determine a and b . (4 marks)



Your Name: _____

Student No. _____

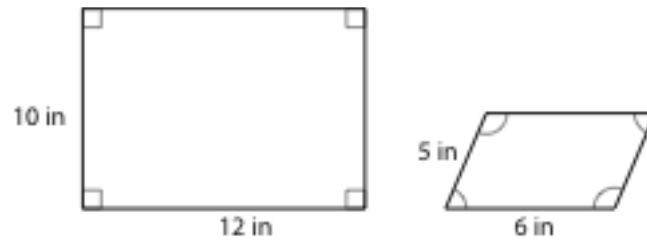
5. The rectangles are similar. Find the value of x . (2 marks)



Your Name: _____

Student No. _____

6. Look at these two quadrilaterals.



Are the two quadrilaterals similar polygons? Why or why not? (2 marks)

Your Name: _____

Student No. _____

Section 2 Assignment Part 3: Similar Triangles

Instructions:

Please show all your work. You may use your AWM 10 Data Pages. **(Total 18 marks)**

1. There are two triangles identified in the Chinese checkers board.

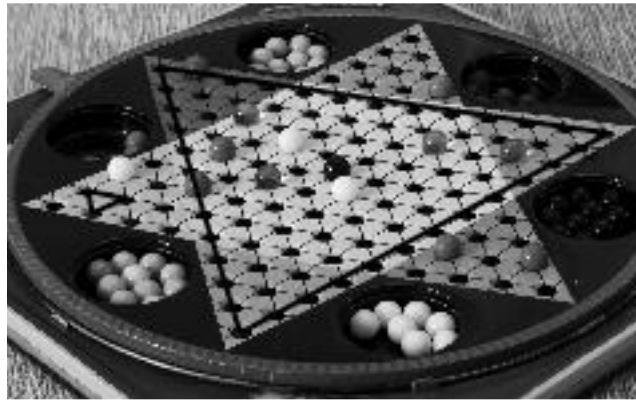


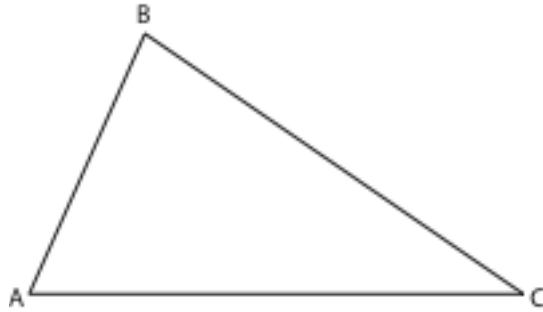
Photo by NicolasMcComber © 2010

Why are the two triangles, identified in black in the photograph, similar? (2 marks)

Your Name: _____

Student No. _____

2. a. Use one of the methods from Lesson C to draw a triangle similar to the one shown below. State the method you used. (2 marks)



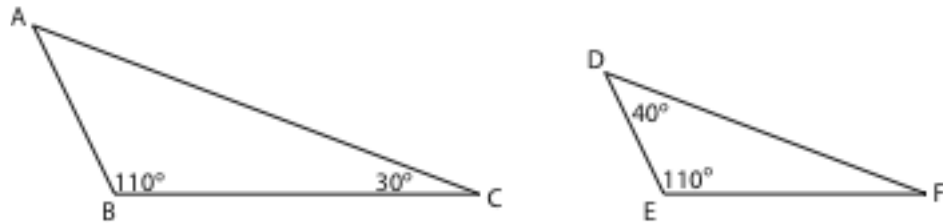
- b. Explain why the triangle you drew is similar to the original. (1 mark)

Your Name: _____

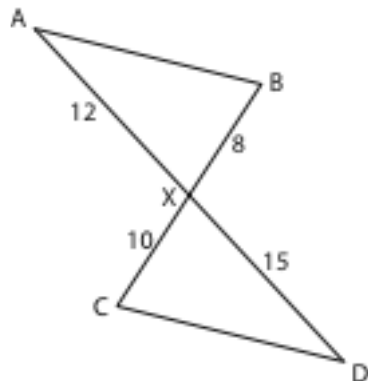
Student No. _____

3. In each case, state whether the triangles identified are similar or not. Support your answers using the conditions of similarity (AAA, SSS, SAS).

- a. $\triangle ABC$ and $\triangle DEF$. (2 marks)



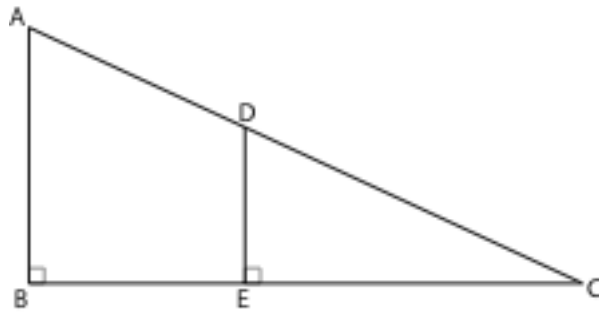
- b. $\triangle ABX$ and $\triangle CDX$. $\overline{AD}$ and $\overline{BC}$ intersect at X . (2 marks)



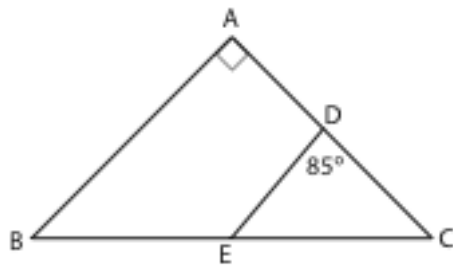
Your Name: _____

Student No. _____

c. $\triangle ABC$ and $\triangle DCE$. (2 marks)



d. $\triangle ABC$ and $\triangle DCE$. (2 marks)



Your Name: _____

Student No. _____

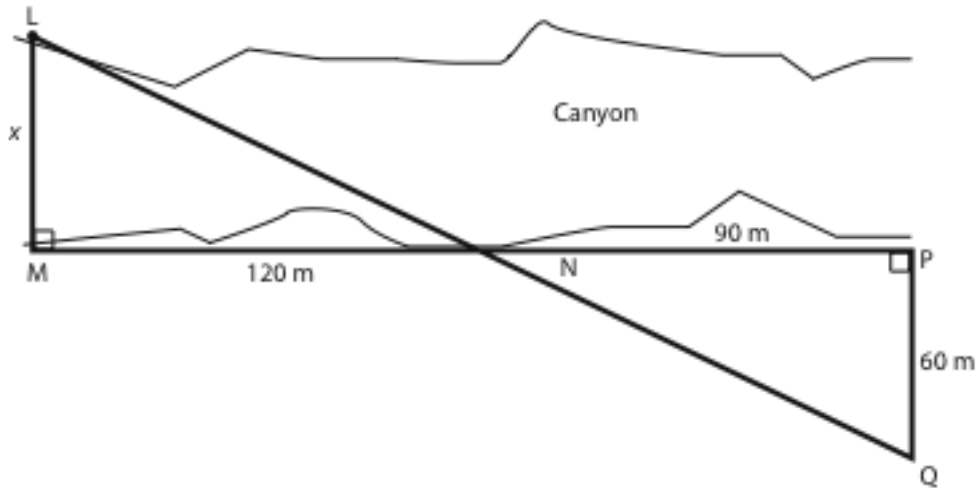
4. Create a question involving similar triangles that you could give to another student taking this course. Include the following:

- A clearly worded question that asks the student to use one (or more) of the conditions for similarity (AAA, SSS, SAS) to show that two triangles are similar.
- Any diagrams that are needed for the student to complete the question.
- A clear and complete solution for your question, including any necessary diagrams.
(5 marks)

Section 2 Assignment Part 4: Applications of Similar Triangles**Instructions:**

Please show all your work. You may use your AWM 10 Data Pages. **(Total 20 marks)**

1. To measure the distance, x , across a canyon, surveyors set up triangles using a landmark L on the opposite side of the canyon.



- a. Explain why the two triangles are similar. (2 marks)

Your Name: _____

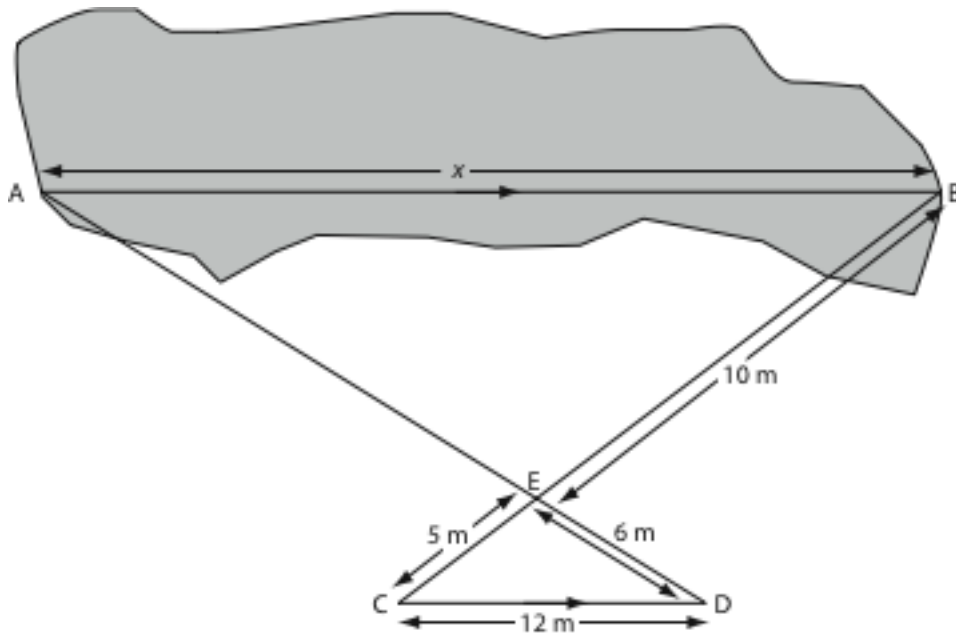
Student No. _____

- b. Calculate x . (2 marks)

Your Name: _____

Student No. _____

2. Similar triangles have been set up to calculate the length, x , of a slough.



- a. $\overline{AB} \parallel \overline{CD}$. Explain why the two triangles are similar. (2 marks)

Your Name: _____

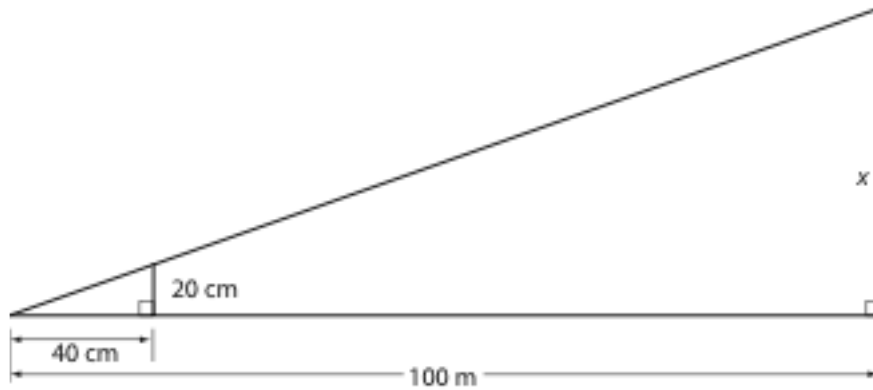
Student No. _____

- b. Calculate x . (2 marks)

Your Name: _____

Student No. _____

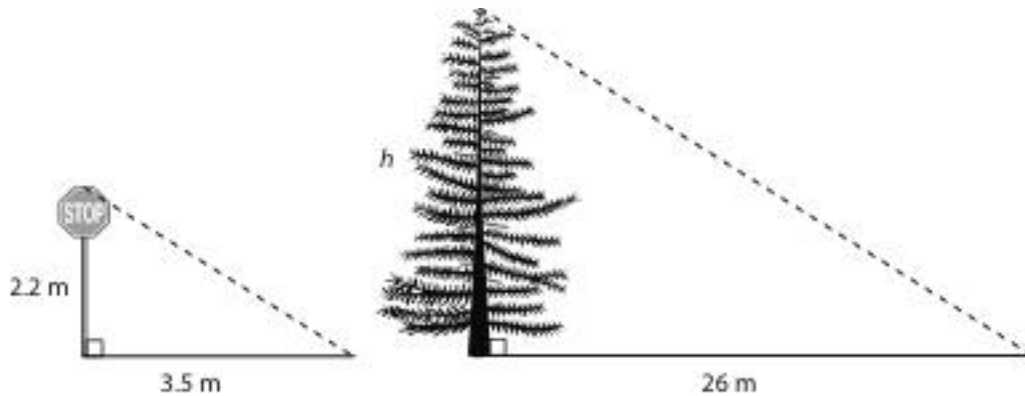
3. Simeon is lying on the ground 100 m from a radio tower. He takes out a 20 cm pencil and holds it out 40 cm towards the tower. The pencil seems to be the same height as the tower. Find the height, x , of the tower. (3 marks)



Your Name: _____

Student No. _____

4. A stop sign 2.2 metres tall casts a shadow 3.5 metres long on the ground. At the same time, a tree makes a shadow 26 metres long.



- a. Explain why the two triangles are similar. (2 marks)

- b. How tall is the tree? (2 marks)

Your Name: _____

Student No. _____

5. Create a problem that involves the application of similar triangles that you could give to another student taking this course. Include the following:
- A clearly worded problem that involves the application of similar triangles in some way.
 - Any diagrams that are needed for the student to complete the problem.
 - A clear and complete solution for your problem, including any necessary diagrams.
- (5 marks)

Section 2 Assignment Part 5: Pythagoras' Theorem**Instructions:**

Please show all your work. You may use your AWM 10 Data Pages. **(Total 20 marks)**

1. In Activity 4 of Lesson E you proved the Pythagorean Theorem through manipulation of cut out shapes. This type of proof is known as a *dissection proof*. There are many examples of this type of proof of Pythagoras' theorem. In this question, you'll try two more examples of this type of proof.

Step 1: Get the two "Dissection Templates" from the end of this part of your section assignment.

Question a. What are the areas of the squares on the templates? Record them in the table below. (3 marks)

Areas of Squares		
	Template 1	Template 2
Smallest square (light grey)		
Mid-sized square (dark grey)		
Largest square (white)		

Step 2: Cut out the pieces of the first template. You will need to cut along all solid lines.

Step 3: Use a protractor to measure the angles in the white triangle. Record these measurements directly on the triangle.

Step 4: Rearrange the shaded pieces so that they fit exactly on top of the largest square. Do not flip the pieces. The shaded sides must be facing up.

Your Name: _____

Student No. _____

Step 5: Glue the white triangle and white square on the next page under “Template 1.” Glue the shaded pieces on top of the white square.

Step 6: Repeat Steps 2 to 5 for the second template. Note: for Step 5, glue the pieces underneath “Template 2.”

Question b. Using your completed table from Question (a) your angle measurements and your completed diagrams, explain how this activity demonstrates the Pythagorean Theorem. (3 marks)

Your Name: _____

Student No. _____

Template 1
(3 marks)

Your Name: _____

Student No. _____

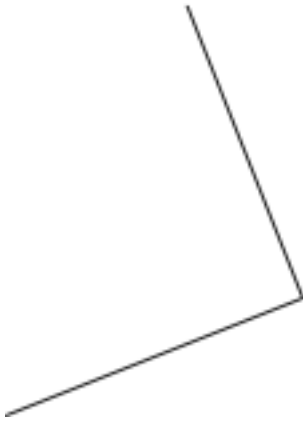
Template 2
(3 marks)

Your Name: _____

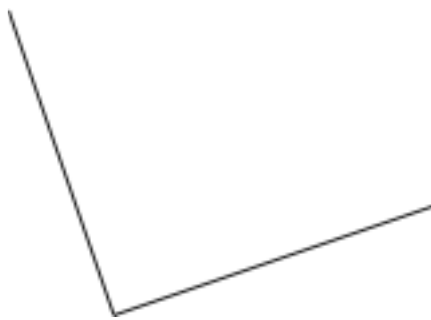
Student No. _____

2. Use the “Carpenter’s Corner” technique from Lesson E to determine whether or not each of the following corners is square. Show any measurements and/or calculations you use and explain your answers. (6 marks)

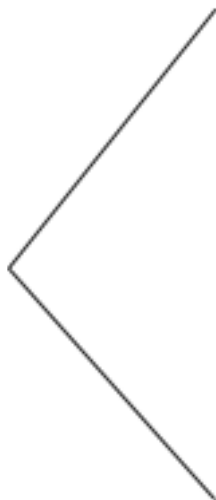
a.



b.



c.

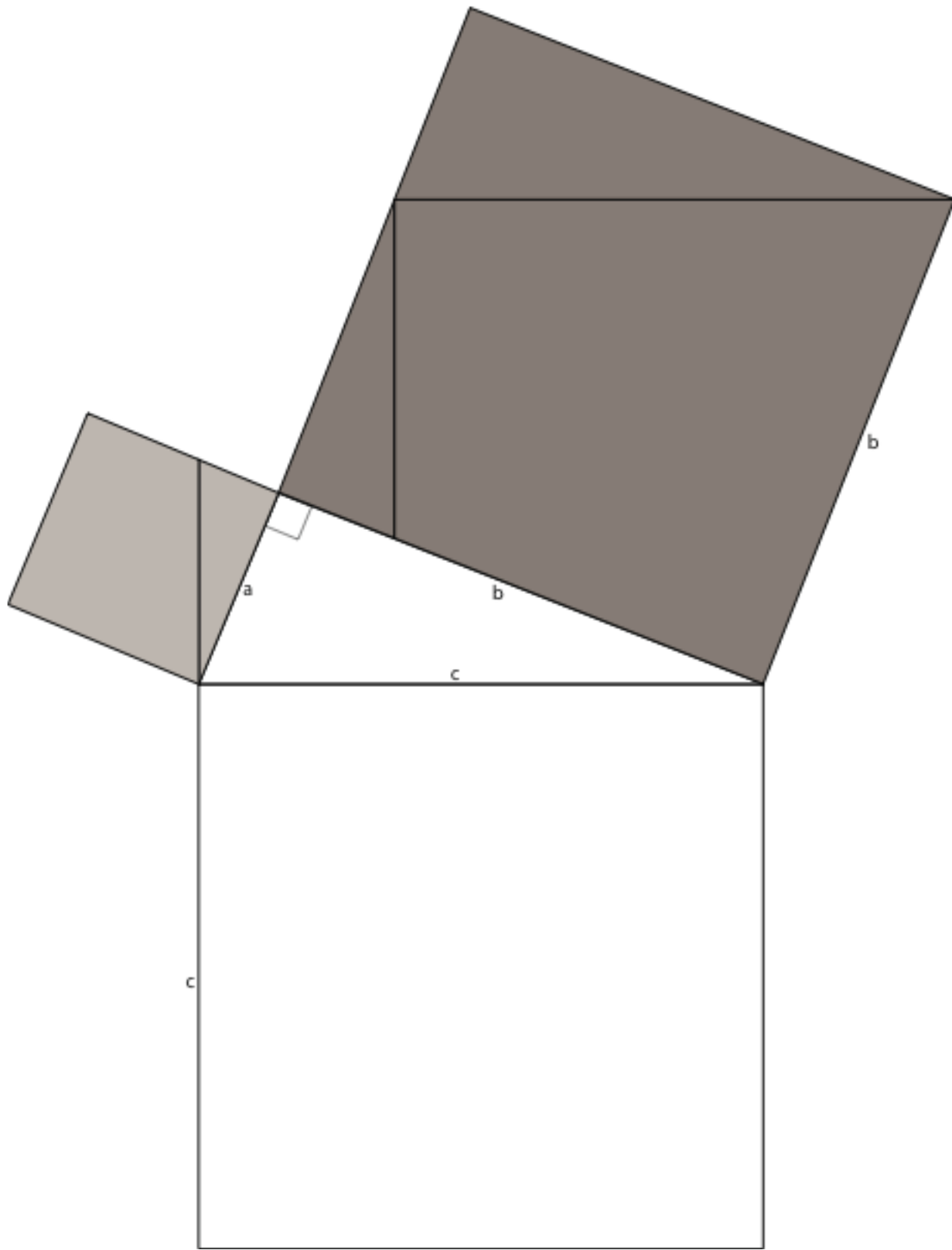


Your Name: _____

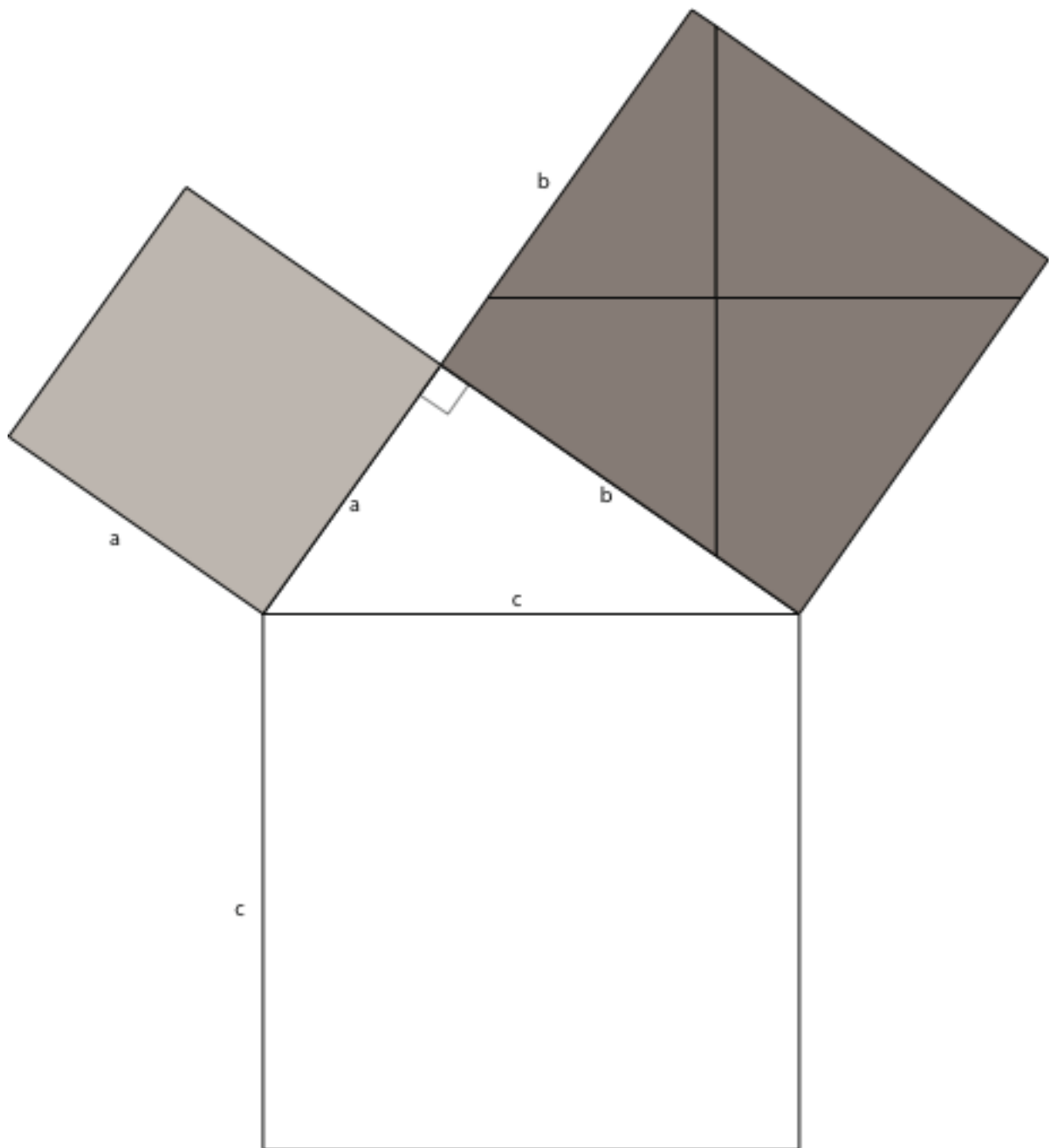
Student No. _____

3. A baseball diamond is a square 30 yards on a side. If you were on second base and you wanted to throw the ball to the catcher, standing at home plate, how far would you have to throw the ball? Round your answer to one decimal place.
(2 marks)

Dissection Template 1



Dissection Template 2



Student No. _____

Instructions:

1. a. Sketch a triangle with sides 8 cm, 10 cm, and 13 cm. (2 marks)

b. Is the triangle you drew in (a) a right triangle? Why or why not? (2 marks)

Your Name: _____ Student No. _____

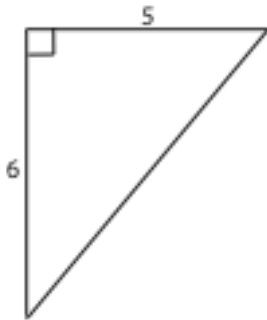
2. Jamal said that 12, 35, 37 form a Pythagorean triple. Is he correct? (2 marks)

Your Name: _____

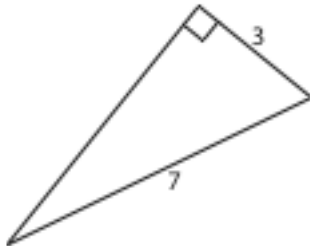
Student No. _____

3. Find the length of the missing side for each of these triangles. All measurements are in centimeters. Round your answers to the nearest tenth. (6 marks)

a.



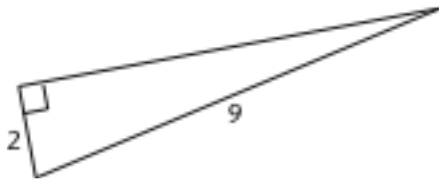
b.



Your Name: _____

Student No. _____

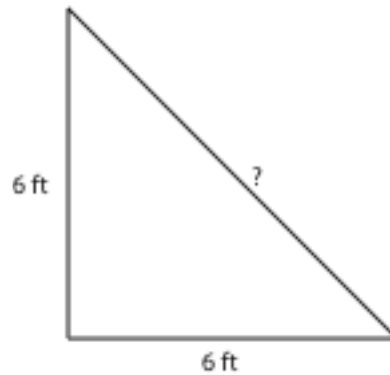
C.



Your Name: _____

Student No. _____

4. Petra is constructing a flower bed in the shape of a right triangle. She used two 6 ft treated timbers to form the right angle as shown.



She has a 8 ft long timber for the third side. Is it long enough? Why or why not? (2 marks)

Your Name: _____

Student No. _____

5. The diagonal of this rectangle is 17 cm long. One side of the rectangle is 8 cm. How long is the other side? (2 marks)

Your Name: _____

Student No. _____

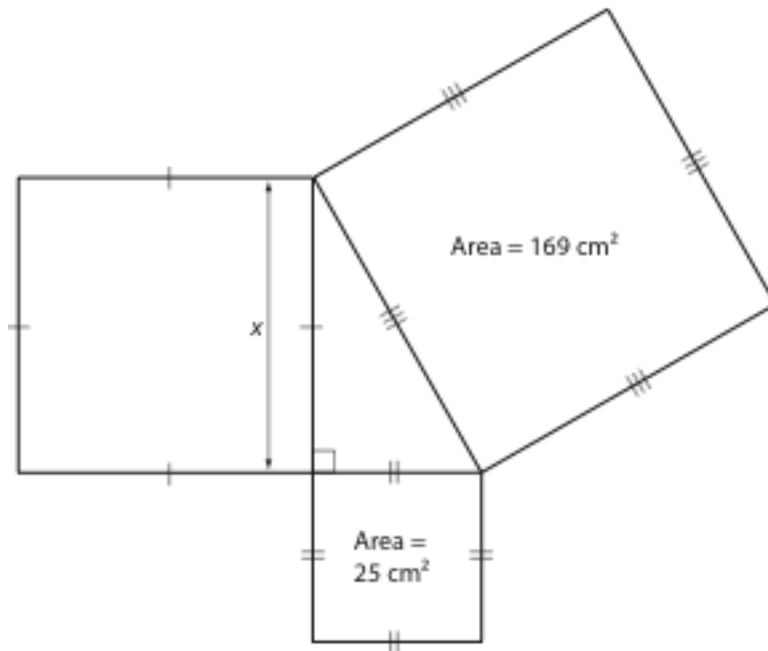
6. The foot of a 12 ft ladder is 3 ft from the foot of a vertical wall. How high up the wall does the ladder reach? Round your answer to one decimal place. (3 marks)

Section 2 Assignment Part 7: Multiple Choice Section Review

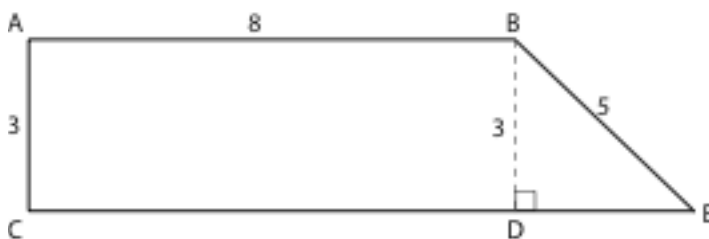
Instructions:

Please complete without a protractor. Please complete the first five questions without a calculator. You may use your AWM 10 Data Pages. Each question is worth 1 mark.
(Total 15 marks)

- In the diagram below, determine the length of x .



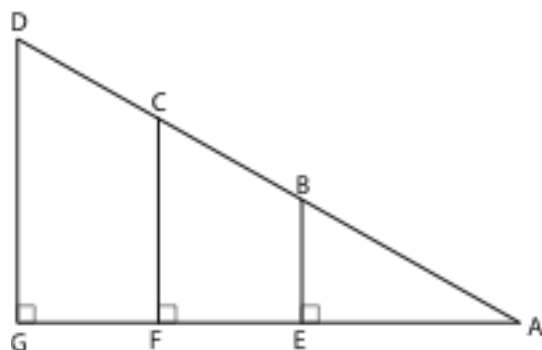
- $\sqrt{8} \text{ cm}$
 - 12 cm
 - 144 cm
 - $\sqrt{194} \text{ cm}$
- What is the length of CE to confirm that $CABE$ is a right trapezoid?



- 4 units

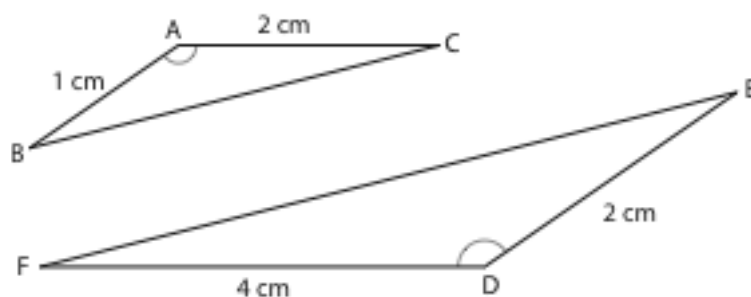
- b. 5 units
- c. 8 units
- d. 12 units

3. Which statement correctly expresses a similarity between two triangles in the diagram below?



- a. $\triangle ACF \sim \triangle AGD$
- b. $\triangle ABE \sim \triangle AFC$
- c. $\triangle ABE \sim \triangle FGD$
- d. $\triangle AFC \sim \triangle AGD$

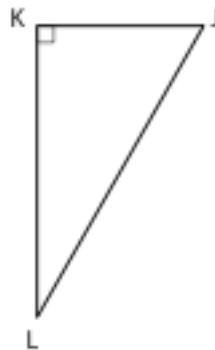
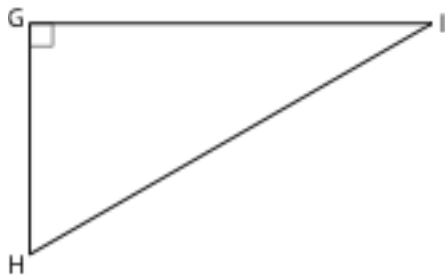
4. Which statements do you need to prove that ABC is similar to DEF?



I	$\frac{AB}{DE} = \frac{AC}{DF}$
II	$A = D$
III	$AC = ED$

- a. I only
- b. II only
- c. I and II only
- d. II and III only

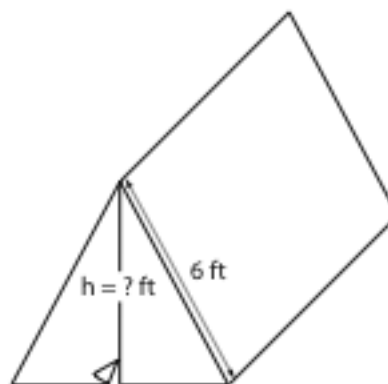
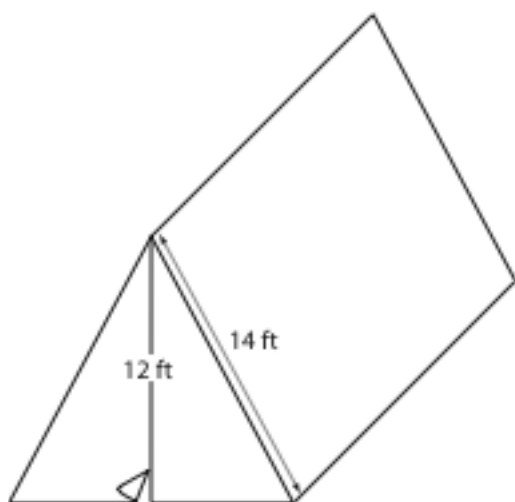
5. HGI and JKL are similar. Find the missing angle measures.



- a. $J = 60^\circ$
 $I \cong L = 30^\circ$
- b. $I = 30^\circ$
 $J \cong L = 60^\circ$
- c. $L = 60^\circ$
 $I \cong J = 30^\circ$
- d. $J = 90^\circ$
 $I \cong L = 30^\circ$

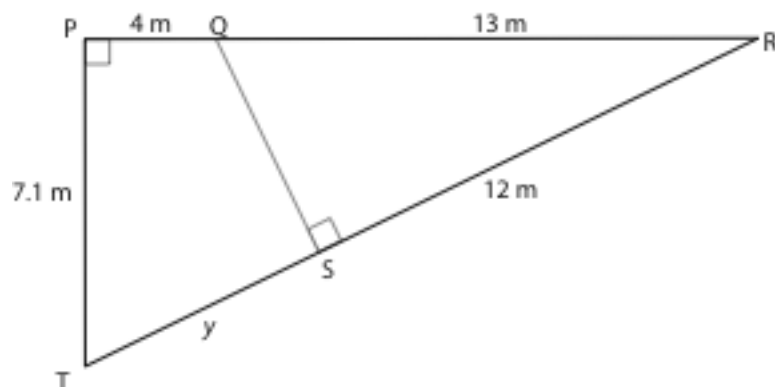
You may use a calculator for the remaining questions if you need one.

6. The two tents below are similar. What is the height of the smaller tent?



- a. 1.7 feet
- b. 5.1 feet
- c. 7.0 feet
- d. 8.0 feet

7. Alyssa was given the following diagram and asked to solve for y to the nearest tenth of a metre.



Her solution is shown below.

$$\frac{12+y}{17} = \frac{13}{12}$$

$$(12)(12+y) = (13)(17)$$

$$12+y = \frac{(13)(17)}{(12)}$$

$$y = \frac{(13)(17)}{(12)}$$

$$y = 6.4\overline{16}$$

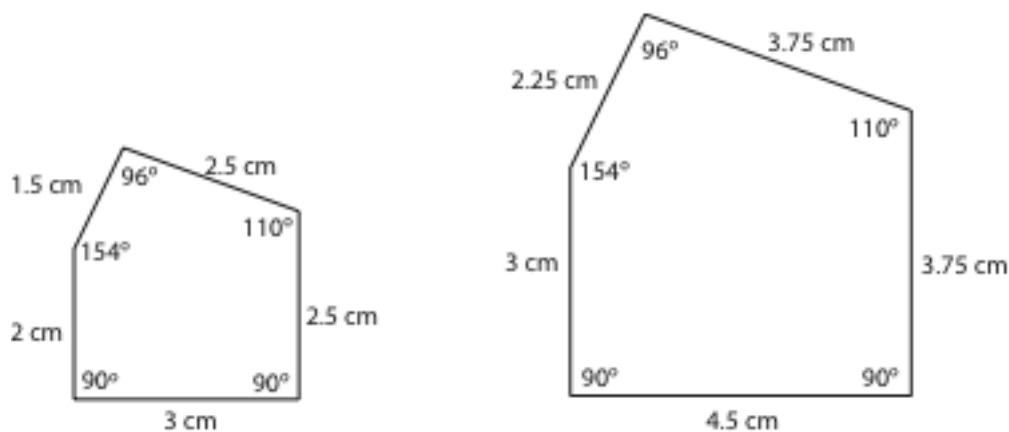
The length given by y on the diagram is equal to approximately 6.4 m.

What can you conclude from the information given?

I	the triangles are similar
II	the triangles are not similar
III	the solution is correct
IV	the solution is incorrect
V	y cannot be determined

- a. I and III only
- b. I and IV only
- c. II and IV only
- d. II and V only

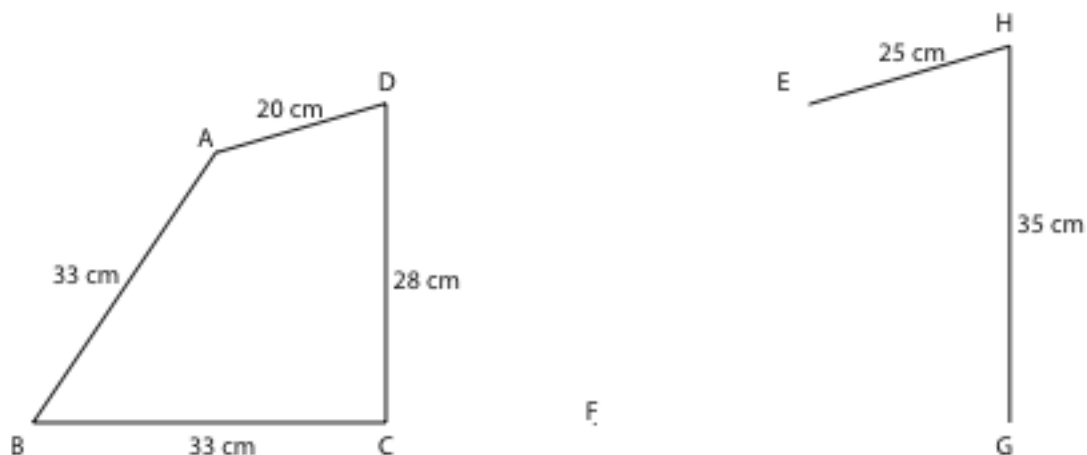
8. Look at the diagram below.



Choose the most correct statement.

- The hexagons are similar because their corresponding angles are equal.
- The hexagons are not similar because the corresponding side lengths are not equal.
- The hexagons are similar because their corresponding angles are equal and their corresponding side lengths are proportional.
- The hexagons are not similar because their corresponding side lengths are not proportional.

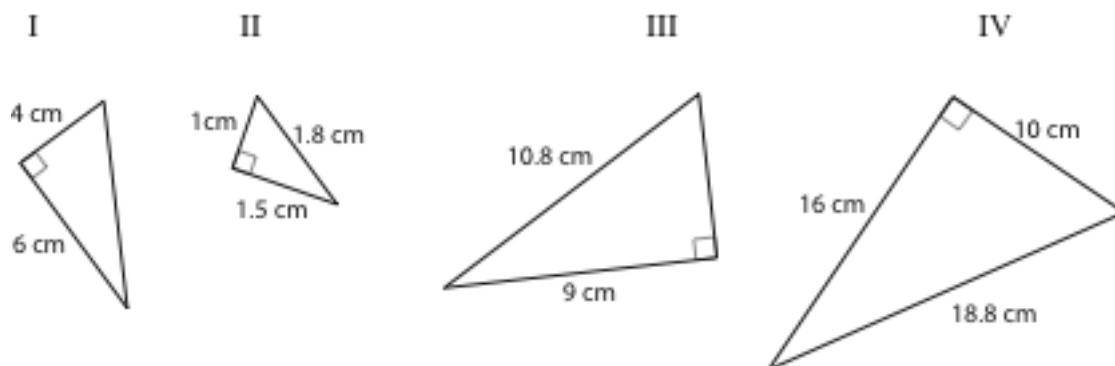
9. David is drawing polygon EFGH so that it is similar to polygon ABCD. How long should he make side FG?



- 26 cm
- 33 cm
- 38 cm

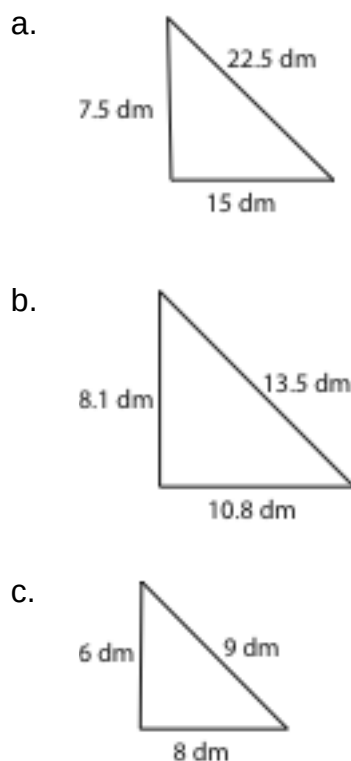
d. 41 cm

10. Which of the following triangles are similar?

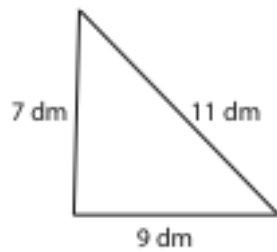


- a. I and II only
- b. II and IV only
- c. I, II and III only
- d. II, III and IV only

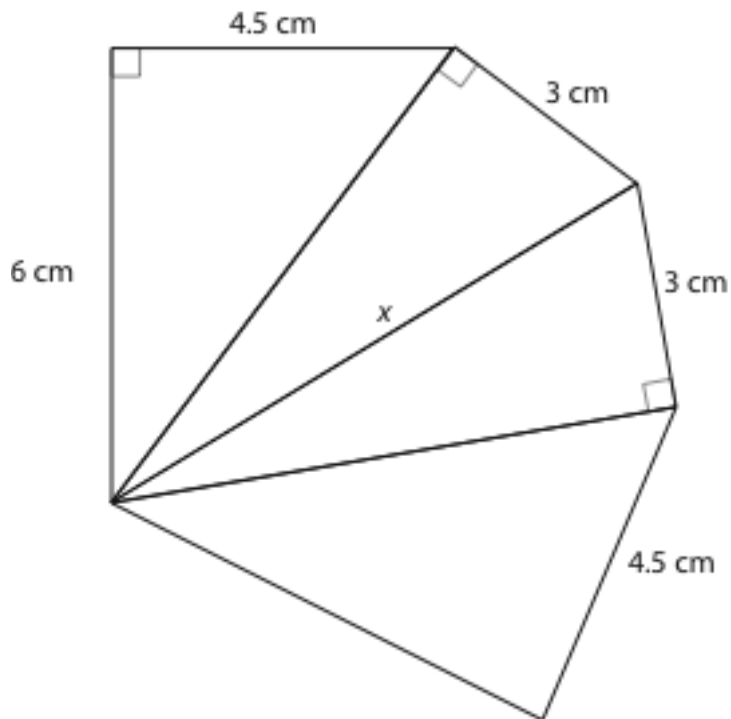
11. Which of the triangles below is a right triangle?



d.



12. What is the value of x in the diagram?



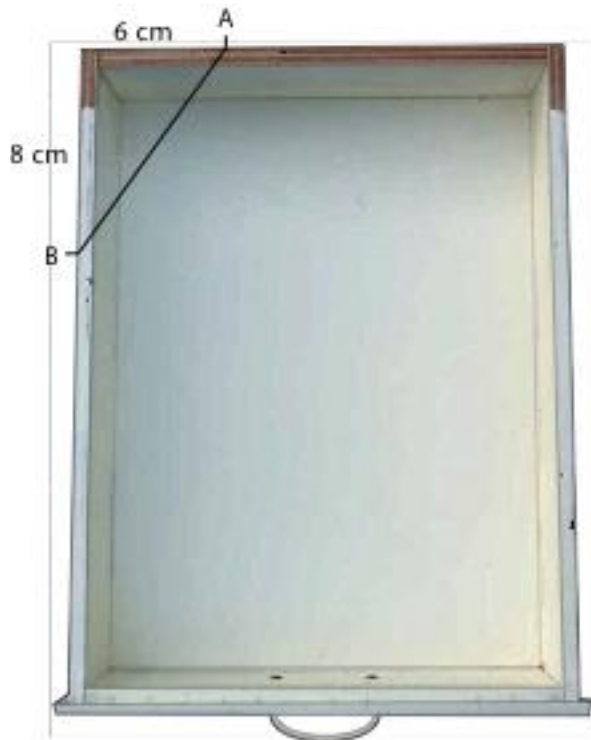
- a. 3.2 cm
- b. 7.5 cm
- c. 8.1 cm
- d. 9.0 cm

13. Justin walked 3.7 km due west from his house. He then turned and walked 1.4 km due south. What is the straight line distance between Justin and his house?

- a. 2.3 km
- b. 3.4 km
- c. 4.0 km
- d. 5.1 km

14. Khira is constructing the drawer pictured below. He wants to make sure the corners are square. To do this, he:

- Measures 6 cm along one side and makes a mark (A).
- Measures 8 cm along the other side and makes a mark (B).
- Measures the distance from A to B and notes that it is 12 cm.



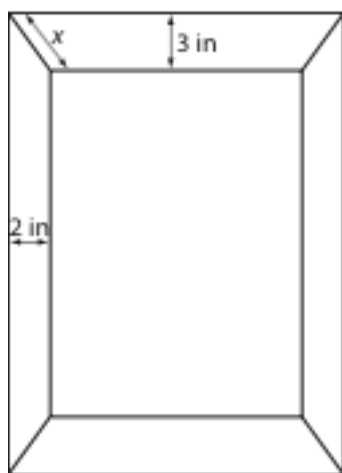
What can Khira conclude about the corner?

I	6, 8, 12 is not a Pythagorean triple
II	6, 8, 12 is a Pythagorean triple
III	The corner is square.
IV	The corner is not square.
V	His procedure was incorrect.

a. I and III

- b. I and IV
- c. II and III
- d. IV and V

15. A picture frame is shown below. Which statement can be used to find the length of the diagonal join, x ?



- a. $\sqrt{3^2 + 2^2}$
- b. $3^2 + 2^2$
- c. $\sqrt{3^2 - 2^2}$
- d. $3^2 - 2^2$

Module 3

Section 3—Lesson A: The Tangent Ratio

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
What is the tangent ratio?			
How is the tangent ratio used to find unknown sides and angles in right triangles?			

Module 3

Section 3—Lesson B: Using Tangents to Solve Problems

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
How is the tangent ratio used to solve a variety of practical problems?			

Module 3

Section 3—Lesson C: The Sine Ratio

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
What is the sine ratio?			
How is the sine ratio used to find unknown sides and angles in right triangles?			

Module 3

Section 3—Lesson D: Using Sines to Solve Problems

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
How is the sine ratio used to solve a variety of practical problems?			

Your Name: _____

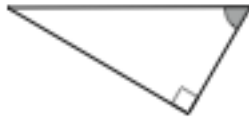
Student No. _____

Section 3 Assignment Part 1: The Tangent Ratio

Instructions:

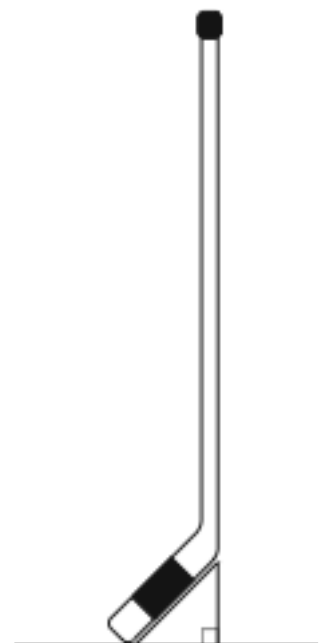
Please show all your work. You may use your AWM 10 Data Pages. **(Total 18 marks)**

1. Label the adjacent and opposite sides and the hypotenuse on each of the triangles below. The reference angles are shaded. (3 marks)



2. This hockey stick is held vertically by the shaft with the blade just touching the ice. The angle between the ice and the blade can be sketched inside a right triangle, as shown.

- a. What is the approximate measure of the angle the blade makes with the ice in the diagram? Explain. (1 mark)



Your Name: _____

Student No. _____

- b. What is the approximate value of the tangent of that angle? Explain.
(1 mark)

3. Determine $\tan 65^\circ$ correct to two decimal places by drawing a right triangle and measuring its sides. Include your drawing and calculations below. Confirm your answer using a calculator. (4 marks)

Your Name: _____

Student No. _____

4. Use your calculator to determine A to the nearest degree, if $\tan A = 0.6$. Write your solution using appropriate notation. (2 marks)

5. a. State the tangent ratio for each of the three angles: 30° , 60° , 75° . Round each to the nearest tenth. (1 mark)

Your Name: _____

Student No. _____

- b. What do you notice about the value of the tangent ratios in Question (a) as the angles increased in size? (1 mark)

- c. In your own words, or using diagrams, explain why the tangent ratio of 20° will be smaller than the tangent ratio of 70° ? (2 marks)

Your Name: _____

Student No. _____

6. The top of a lighthouse is “ x ” metres above sea level. From a ship at sea its angle of elevation is 4° . The ship is 5 kilometres away.
- a. Draw a diagram that models this scenario. Include a right triangle in the diagram and include all given measurements. Label the unknown side with an “ x .” (1 mark)
- b. How tall is the lighthouse, to the nearest metre? Show your calculations. (2 marks)

Your Name: _____

Student No. _____

Section 3 Assignment Part 2: Using Tangents to Solve Problems

Instructions:

Please show all your work. Draw a diagram and show calculations, whenever possible.

You may use your AWM 10 Data Pages. **(Total 15 marks)**

1. Determine x to two decimal places. (2 marks)



Your Name: _____

Student No. _____

2. A child 4 feet tall casts a shadow along the ground 5 feet in length. To the nearest degree, what is the angle of elevation of the sun? (2 marks)

Your Name: _____

Student No. _____

3. The stairs on each face of the Temple of Kukulcan described in Lesson B are inclined at 45° to the horizontal. A tour guide estimates the horizontal distance to the centre of the temple from the outside edge to be approximately 25 m. Calculate the approximate height of the temple. Include a diagram in your answer. (3 marks)

Your Name: _____

Student No. _____

4. The angle of elevation to the top of a tree is 62° . If the tree 38 m tall, how far away was the observer standing when he measured the angle of elevation? Include a diagram and round your answer to the nearest metre. (3 marks)

Your Name: _____

Student No. _____

5. From a window in your home or school, use your clinometer to measure the angle of depression of an object below you and some distance away. Measure the height of the clinometer above the ground when you took the angle measurement. Then, use the tangent ratio to calculate the distance the object was away. Include a diagram with your work. (5 marks)

Your Name: _____

Student No. _____

Section 3 Assignment Part 3: The Sine Ratio

Instructions:

Please show all your work. Draw a diagram and show calculations, whenever possible.

You may use your AWM 10 Data Pages. **(Total 14 marks)**

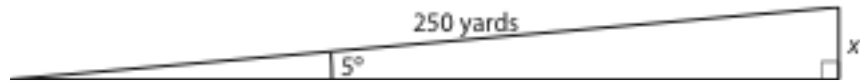
1. a. State the sine ratio for each of the three angles: 30° , 60° , 75° . Round each to two decimal places. (1 mark)

-
- b. What do you notice about the value of the sine ratios in Question (a) as the angles increased in size? (1 mark)

Your Name: _____

Student No. _____

2. In the Lesson C Focus, you read about how difficult it is for even expert golfers to drive a golf ball along an intended path. Suppose you can consistently drive a golf ball through the air for 250 yards. If the ball ends up 5° off course, how many yards will it end up off the desired path? Round your answer to the nearest yard? (2 marks)



Your Name: _____

Student No. _____

3. Determine $\sin 35^\circ$ correct to two decimal places by drawing a right triangle and measuring its sides. Include your drawing and calculations. Confirm your answer by using a calculator. (4 marks)

Your Name: _____

Student No. _____

4. By drawing a triangle and using your protractor, determine A to the nearest degree, if $\sin A = 0.4$. Show all your work. (4 marks)

Your Name: _____

Student No. _____

5. Use your calculator to determine A to the nearest tenth of a degree, if $\sin A = 0.6543$. Write your solution using appropriate notation. (2 marks)

Your Name: _____

Student No. _____

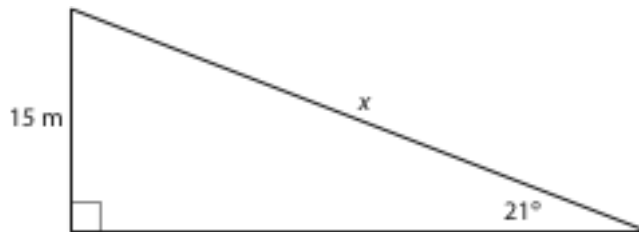
Section 3 Assignment Part 4: Using Sines to Solve Problems

Instructions:

Please show all your work. Draw a diagram and show calculations, whenever possible.

You may use your AWM 10 Data Pages. **(Total 13 marks)**

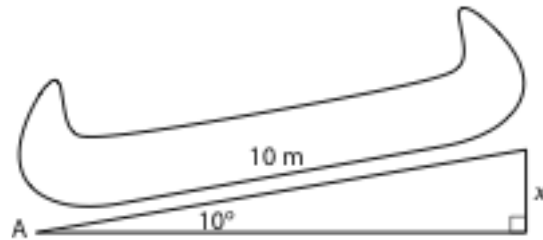
1. Determine x to two decimal places. (2 marks)



Your Name: _____

Student No. _____

2. A Montreal canoe, 10 m in length, is descending rapids. The canoe tilts forward 10° . Use the following diagram to help find how high the stern is raised from its normal position. Round your answer to the nearest tenth of a metre. (2 marks)



Your Name: _____

Student No. _____

3. A ladder 12 ft long reaches 10 ft up a vertical wall. To the nearest degree, what angle does the ladder make with the ground? Include a diagram with your answer. (3 marks)

Your Name: _____

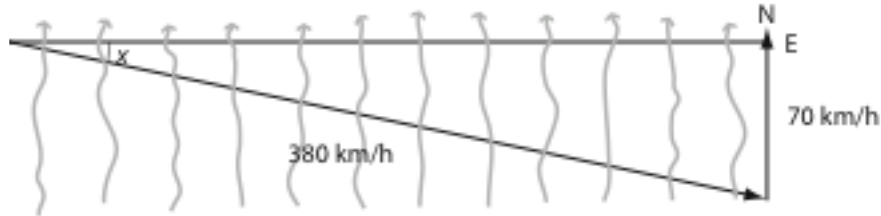
Student No. _____

4. The angle of elevation of a kite is 56° . If the kite is being flown at the end of a string 200 m in length, what is its altitude? Include a diagram and round to the nearest 10 m. (3 marks)

Your Name: _____

Student No. _____

5. A wind is blowing north at 70 km/h. An airplane travelling at 380 km/h is flying east. At what angle, south of east, must the plane be aimed in order to actually travel straight east?



- a. A student's solution is shown below. Identify and explain the error that the student made. (2 marks)

$$\begin{aligned}\sin X &= \frac{\text{opp}}{\text{hyp}} \\ \sin X &= \frac{70}{380} \\ X &= 0.1842 \dots\end{aligned}$$

The plane must fly at an angle of 0.18° .

- b. Solve the problem correctly. At what angle, south of east, must the plane be aimed in order to actually travel straight east? Round your answer to the nearest degree. (1 mark)

Section 3 Assignment Part 5: Multiple Choice Section Review

Instructions:

Please complete without a protractor. Please complete the first five questions without a calculator. You may use your AWM 10 Data Pages. Each question is worth 1 mark.

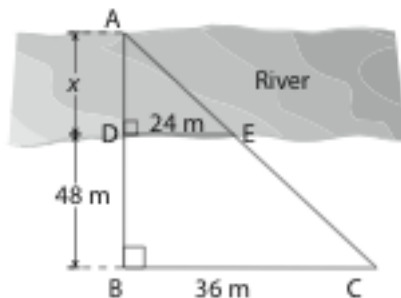
(Total 15 marks)

1. If $\sin 40^\circ \approx 0.65$, what is a reasonable answer for $\sin 80^\circ$?

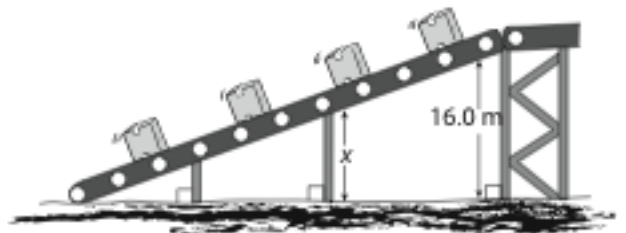
- a. 1.2
- b. 0.98
- c. 0.5
- d. 0.23

2. Which of the following situations **does not** have enough information in order to find x ?

a.



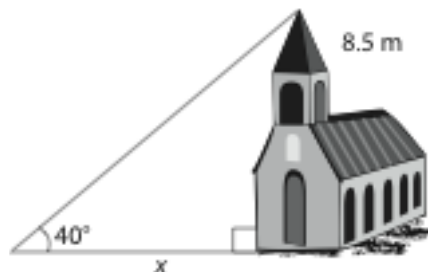
b.



c.



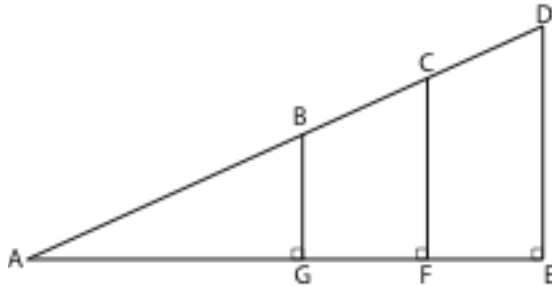
d.



3. Which statement is always true about the opposite side in a right triangle?

- a. The opposite side is across from the smallest acute angle in a right triangle.
- b. The opposite side is across from the reference angle in the triangle.
- c. The opposite side meets the hypotenuse at the reference angle.
- d. The opposite side is the shortest side in the right triangle.

4. Consider the similar triangles shown below. Select the relationship that could be used to generalize the formula for the sine ratio of $\angle A$.

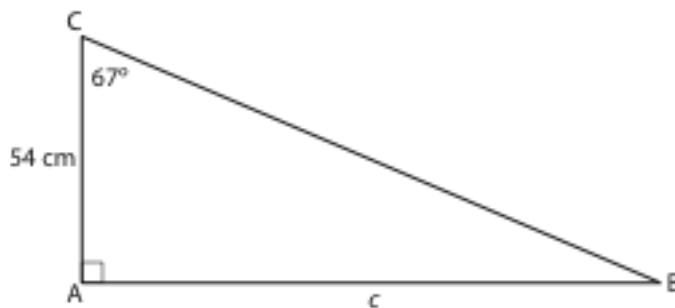


- a. $\frac{BG}{AB} = \frac{CF}{AC} = \frac{DE}{AD}$
 b. $\frac{BG}{AG} = \frac{CF}{AF} = \frac{DE}{AE}$
 c. $\frac{AB}{AG} = \frac{AC}{AF} = \frac{AD}{AE}$
 d. $BG = CF = DE$

5. If $\tan 40^\circ \approx 0.84$, what is a reasonable answer for $\tan 80^\circ$?
- a. 0.42
 b. 1
 c. 1.68
 d. 5.67

You may use a calculator for the remaining questions if you need one.

6. What is the length of c ?

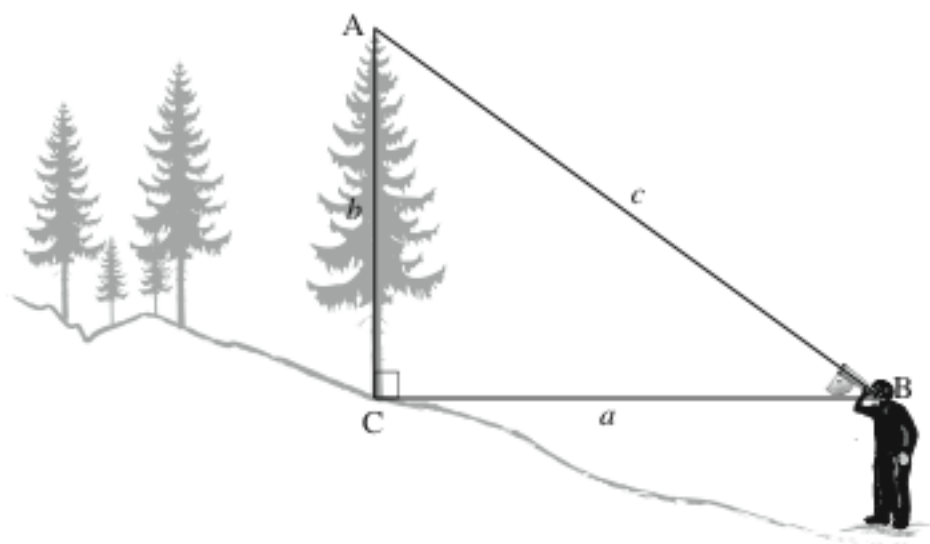


- a. 22.92 cm
- b. 49.71 cm
- c. 58.66 cm
- d. 127.22 cm

7. A ladder that measures 2.75 metres is leaning against a wall. It reaches 1.5 metres up a wall. What angle does the ladder make with the ground?

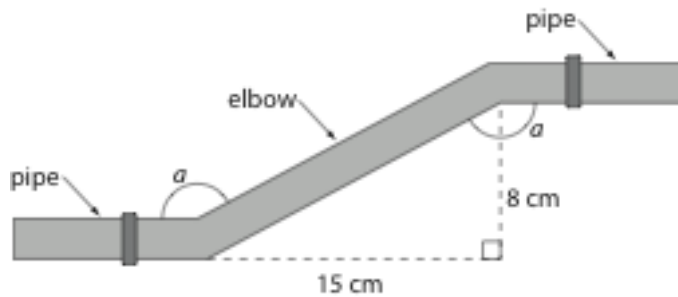
- a. 27°
- b. 33°
- c. 57°
- d. 61°

8. In the diagram below, determine $\sin A$.

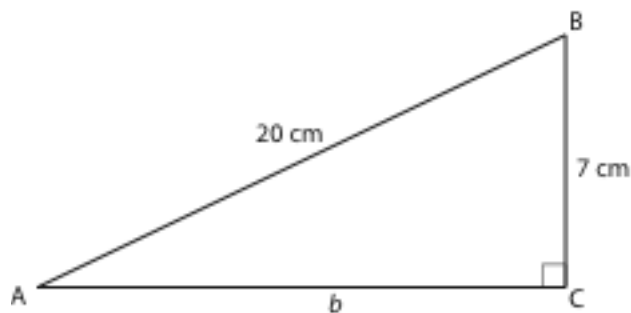


- a. $\frac{a}{b}$
- b. $\frac{b}{a}$
- c. $\frac{b}{c}$
- d. $\frac{a}{c}$

9. Two pipes are installed parallel but offset as shown below. To join them, an “elbow” pipe will be custom made. What should be the measure of a ?



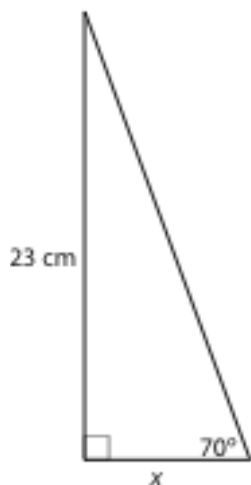
- a. 28°
 b. 118°
 c. 152°
 d. 160°
10. A person is flying a kite and has let out 350 m of string. The kite's angle of elevation is 55° . If a person is standing directly below the kite, how far above that person is the kite?
- a. 245 m
 b. 287 m
 c. 427 m
 d. 500 m
11. Which equation is not a true statement?



- a. $\tan A = \frac{7}{20}$
 b. $b^2 + 7^2 = 20^2$
 c. $\sin A = \frac{7}{20}$

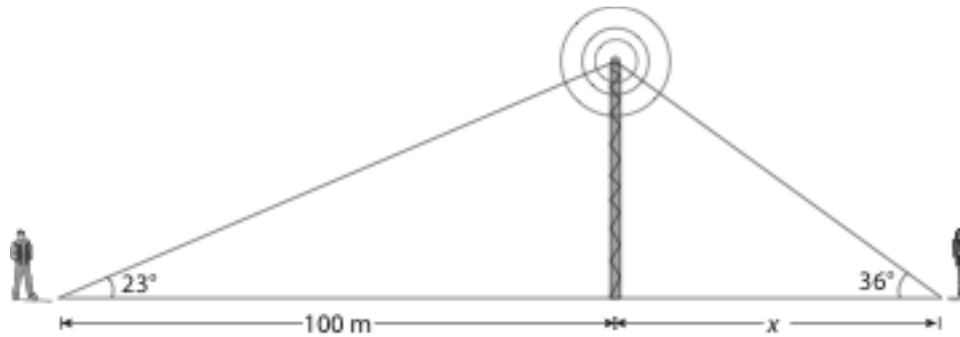
d. $\angle A = \sin^{-1}\left(\frac{7}{20}\right)$

12. Find the missing side, to the nearest tenth.



- a. 2.4 cm
b. 2.7 cm
c. 8.4 cm
d. 21.6 cm
13. An 86 m guy wire is fastened to the base of a television tower. The wire is attached to the tower, 70 m above the ground. At what angle is the guy wire attached to the ground?
- a. 14°
b. 50°
c. 51°
d. 54°
14. You are in a tower 5.4 m above the ground. The angle of depression to a fire hydrant is 42°. How far is the fire hydrant from the tower?
- a. 6 m
b. 3.6 m
c. 7.8 m
d. 1.3 m

15. Terry and Samantha are standing on opposite sides of a cell phone tower. Terry is standing 100 m from the tower. His angle of elevation is 23° . Samantha's angle of elevation to the tower is 36° . How far from the base of the tower is she standing?



- a. 25.0 m
- b. 30.8 m
- c. 58.4 m
- d. 72.2 m

Module 3

Section 4—Lesson A: The Cosine Ratio

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
What is the cosine ratio?			
How is the cosine ratio used to find unknown sides and angles in right triangles?			

Module 3

Section 4—Lesson B: Using Cosines to Solve Problems

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
How is the cosine ratio used to solve a variety of practical problems?			

Module 3

Section 4—Lesson C: General Problems

ESSENTIAL QUESTIONS	Before the Lesson: What I Know	After the Lesson: What I Learned	Examples
How are the appropriate trigonometric ratios identified and applied to a variety of practical problems?			

Your Name: _____

Student No. _____

Section 4 Assignment Part 1: The Cosine Ratio

Instructions:

Please show all your work. You may use your AWM 10 Data Pages. **(Total 10 marks)**

1. Determine $\cos 35^\circ$ correct to two decimal places by drawing and measuring the sides of a right triangle. (4 marks)

Your Name: _____

Student No. _____

2. By drawing a triangle and using your protractor, determine A to the nearest degree, if $\cos A = 0.4$. (4 marks)

Your Name: _____

Student No. _____

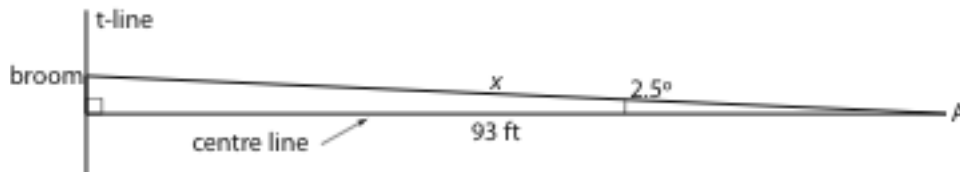
3. Use your calculator to determine A to the nearest tenth of a degree, if $\cos A = 0.6534$. Write your solution using appropriate notation. (2 marks)

Section 4 Assignment Part 2: Using Cosines to Solve Problems**Instructions:**

Please show all your work. Draw a diagram and show calculations, whenever possible.

You may use your AWM 10 Data Pages. **(Total 10 marks)**

1. A skip positions her broom along the T-line in the house 2.5° to the right of the centre line. Refer to the diagram.



How far is the broom, to the nearest inch, from the point the curler must release the stone? To answer this question, solve for x in the diagram. (3 marks)

Your Name: _____

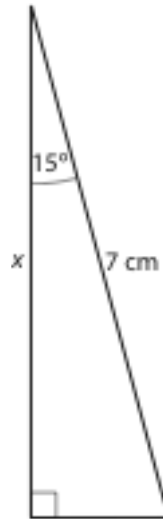
Student No. _____

2. The foot of a ladder 3 m long is 0.5 m from a vertical wall. To the nearest degree, what angle does the ladder make with the ground? Include a diagram with your solution. (3 marks)

Your Name: _____

Student No. _____

3. The following is a right triangle. The length of one of its sides is represented by x .

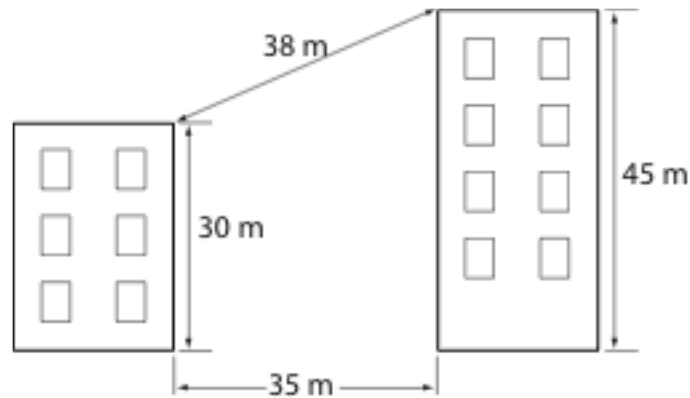


Determine x to two decimal places. (2 marks)

Your Name: _____

Student No. _____

4. Two apartment buildings are 35 m apart. One building is 30-m high, and the other structure is 45-m high. As shown in the diagram, a 38 m cable is strung from the roof of one building to the roof of the other.

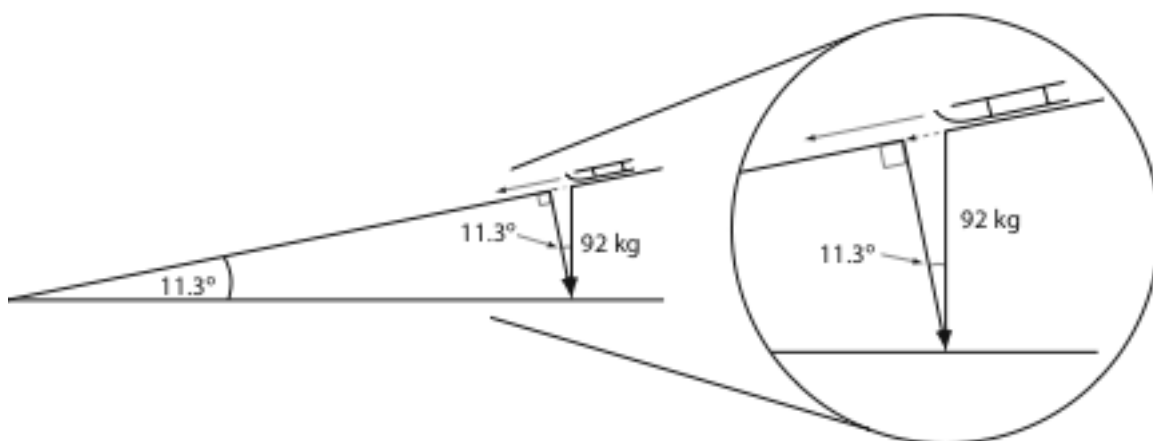


What is the angle of elevation of the cable? Round to the nearest degree.
(2 marks)

Section 4 Assignment Part 3: General Problems**Instructions:**

Please show all your work. Draw a diagram and show calculations, whenever possible. You may use your AWM 10 Data Pages. **(Total 20 marks)**

1. In the Lesson A Focus, you read about the forces on a skeleton rider and sled. In the following diagram, a rider and sled with a combined mass of 92 kg are on corner 2. This corner has a slope of 11.3° .



A coach might use the forces diagram to examine the effects of different forces during a skeleton race.

- a. Which trigonometric ratio would you use to find the size of the dashed arrow? Why? (1 mark)

- b. Which trigonometric ratio would you use to find the size of the solid arrow? Why? (1 mark)

Your Name: _____ Student No. _____

Your Name: _____ Student No. _____

- c. Find the size, to the nearest kilogram, of the force (dashed arrow) down slope. (2 marks)
- d. Find the size, to the nearest kilogram, of the force (bold arrow) pressing the sled to the slope. (2 marks)

Your Name: _____

Student No. _____

2. In the photo, an athlete from Northern Canada demonstrates his prowess in two-foot high kick. In this game, a participant must strike the suspended object with both feet.



Photo by Xander © 2010

- a. Through what angle from the vertical would you estimate this athlete has swung his legs up to strike the suspended object? Explain how you arrived at this estimate. (1 mark)

- b. Would it be possible to draw a right triangle that contains this angle? Why, or why not? (1 mark)

Your Name: _____

Student No. _____

3. In $\triangle ABC$, $C = 90^\circ$, $A = 22^\circ$, and $c = 7$ cm. Solve $\triangle ABC$. Round to one decimal place where appropriate. (6 marks)

Your Name: _____

Student No. _____

4. In $\triangle ABC$, $B = 90^\circ$, $c = 6$ cm, and $a = 8$ cm. Solve $\triangle ABC$. Round to one decimal place where appropriate. (6 marks)

Section 4 Assignment Part 4: Multiple Choice Section Review

Instructions:

Please complete without a protractor. Please complete the first five questions without a calculator. You may use your AWM 10 Data Pages. Each question is worth 1 mark.
(Total 15 marks)

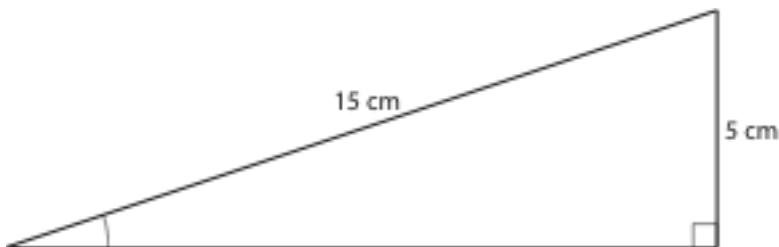
1. Which of the following ratios represents cosine?

- a. $\frac{\text{opposite}}{\text{adjacent}}$
- b. $\frac{\text{opposite}}{\text{hypotenuse}}$
- c. $\frac{\text{adjacent}}{\text{opposite}}$
- d. $\frac{\text{adjacent}}{\text{hypotenuse}}$

2. If $\cos 60^\circ = 0.5$, what is the sine of 60° ?

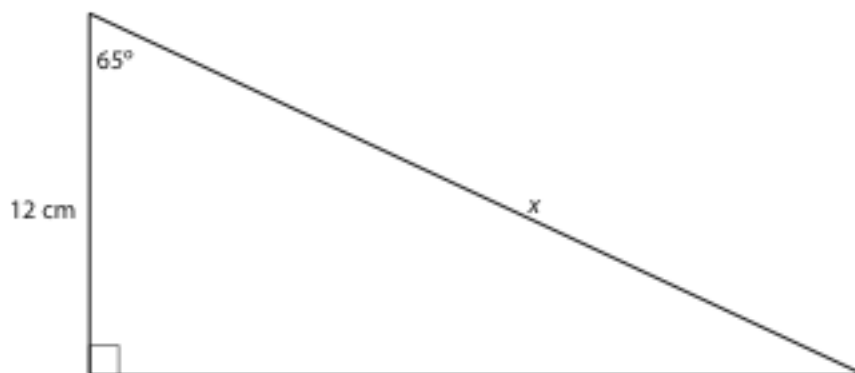
- a. 2
- b. 1
- c. 0.5
- d. 0.866

3. Which of the following would you use to find the shaded angle in the diagram?



- a. sine
- b. cosine
- c. tangent
- d. Pythagoras' Theorem

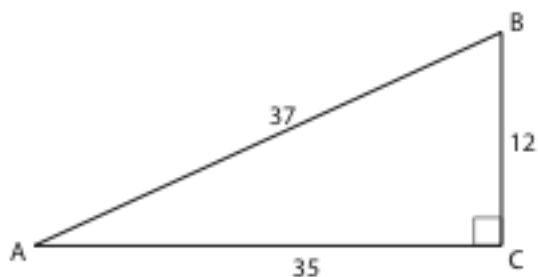
4. When you are given two lengths in a right triangle, which information are you able to find?
- a. the length of the third side
 - b. the measure of one of the acute angles
 - c. the measure of either acute angle
 - d. all of the above
5. Which of the following equations could be used to determine x in the following triangle?



- a. $\cos = \frac{12}{x}$
- b. $\cos 65^\circ = \frac{12}{x}$
- c. $\sin 65^\circ = \frac{12}{x}$
- d. $\sin = \frac{12}{x}$

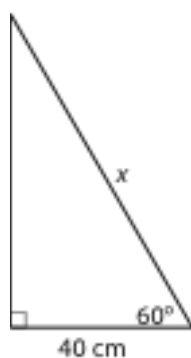
You may use a calculator for the remaining questions if you need one.

6. What is $\cos B$?



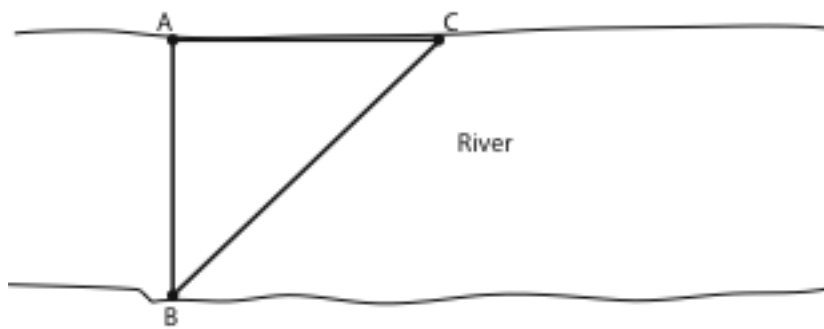
- a. 1.0571
- b. 0.9459
- c. 0.3429
- d. 0.3243

7. What is the value of x ?



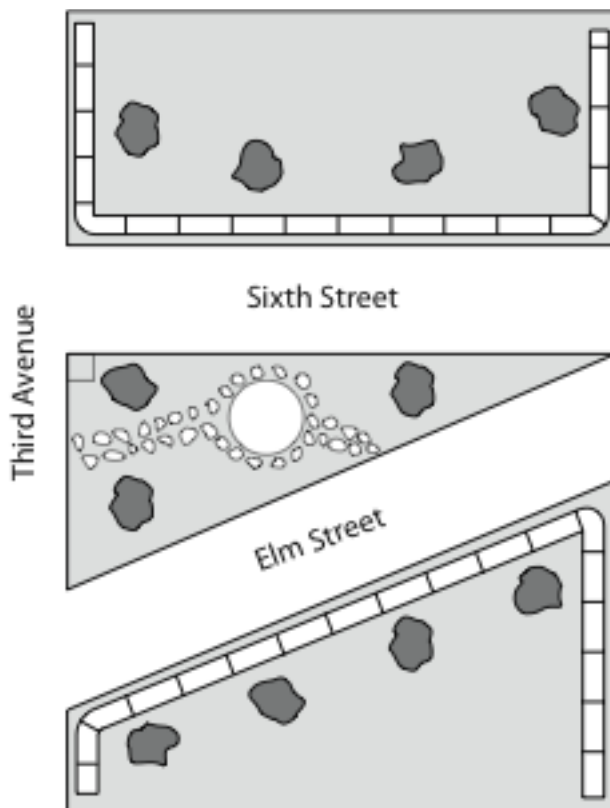
- a. 20 cm
- b. 35 cm
- c. 46 cm
- d. 80 cm

8. To calculate the distance from A to B across a river, Surhan took sightings and measured the distance from A to C. He found that $AC = 150$ m, $C = 50^\circ$, and $A = 90^\circ$. What is the distance from A to B in metres?



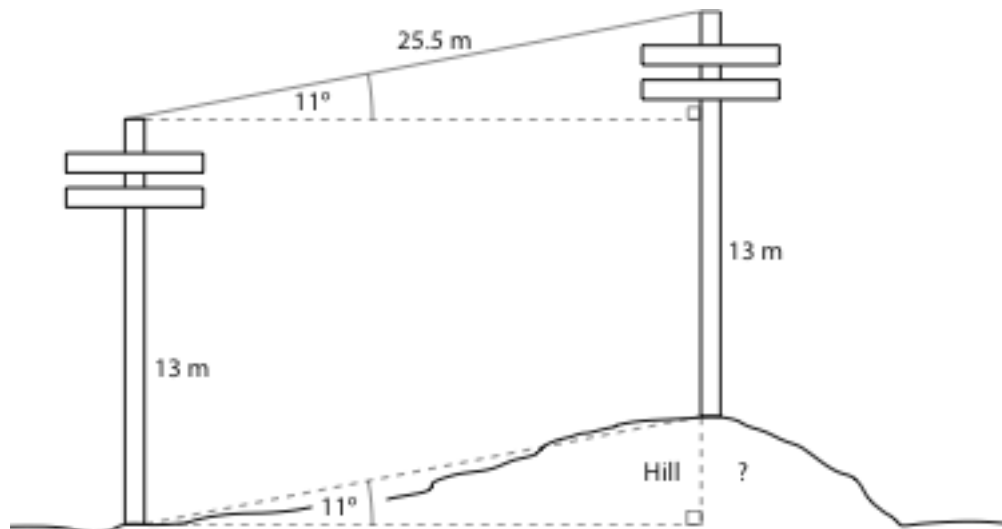
- a. 96.4 m
- b. 114.9 m
- c. 150.0 m
- d. 178.8 m

9. In your neighbourhood, there is a small park shaped like a triangle and found between Sixth and Elm and enclosed by Third Avenue. The side of the park that faces Sixth Street is 80 feet long. The side of the park that faces Third Avenue is 30 feet in length. What is the approximate length of the side of the park that faces Elm Street?

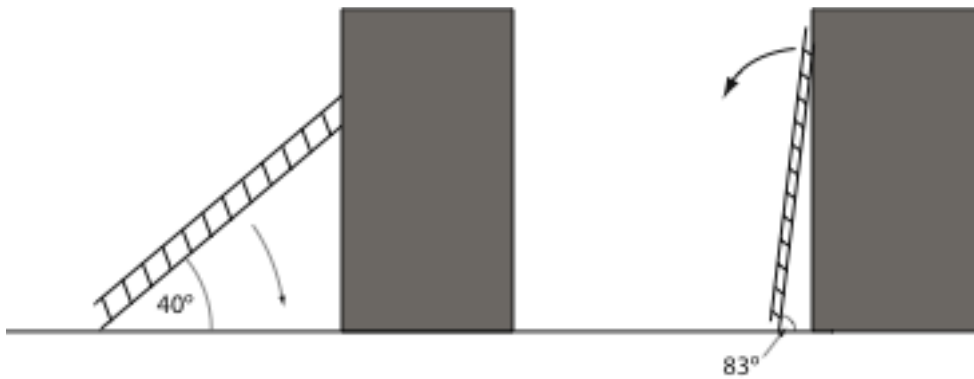


- a. 35 ft
- b. 40 ft
- c. 85 ft
- d. 110 ft

10. What is the height of the hill?



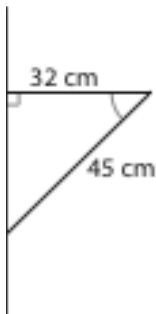
- a. 4.9 m
 - b. 17.9 m
 - c. 21.2 m
 - d. 30.9 m
11. A surveyor is working on the Sea to Sky Highway from Vancouver to Whistler. He needs to find the height of a cliff. If he stands 46.8 metres away from the base, the angle of elevation is 54° to the top of the cliff. What is the height of the cliff?
- a. 64.4 m
 - b. 34.0 m
 - c. 37.9 m
 - d. 79.6 m
12. An unsecured ladder is considered safe if the ladder makes a 75° angle with the ground. If the angle is less than 75° , the ladder may slip. Too much more than 75° and it will fall away from the wall.



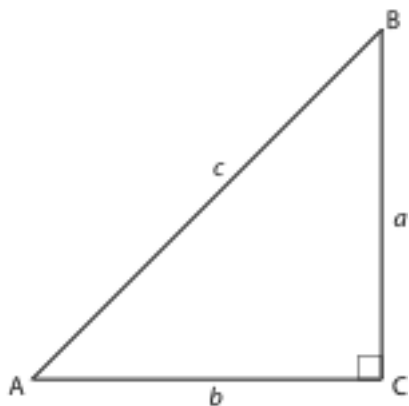
Consider an unsecured ladder that is 8.8 feet long and is placed with the foot of the ladder 3.7 feet away from the wall. Will this ladder slip, fall away from the wall or be safe?

- a. slip
- b. fall away
- c. be safe
- d. not enough information

13. A 32 centimetre shelf is attached to a shop wall at right angles. A supporting bracket, 45 cm long, supports the end of the shelf. What is the size of the angle formed by the bracket with the shelf?

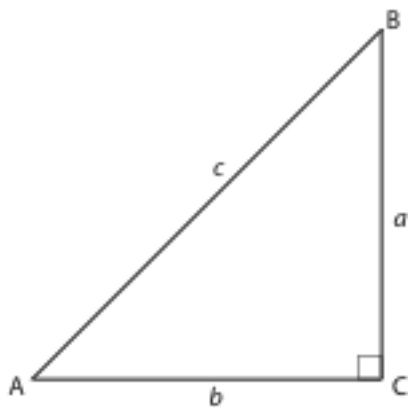


- a. 35.4°
 - b. 44.7°
 - c. 45.3°
 - d. 54.6°
14. Solve the following triangle, where $a = 15$ cm and $b = 24$ cm. (Triangle is not drawn to scale.)



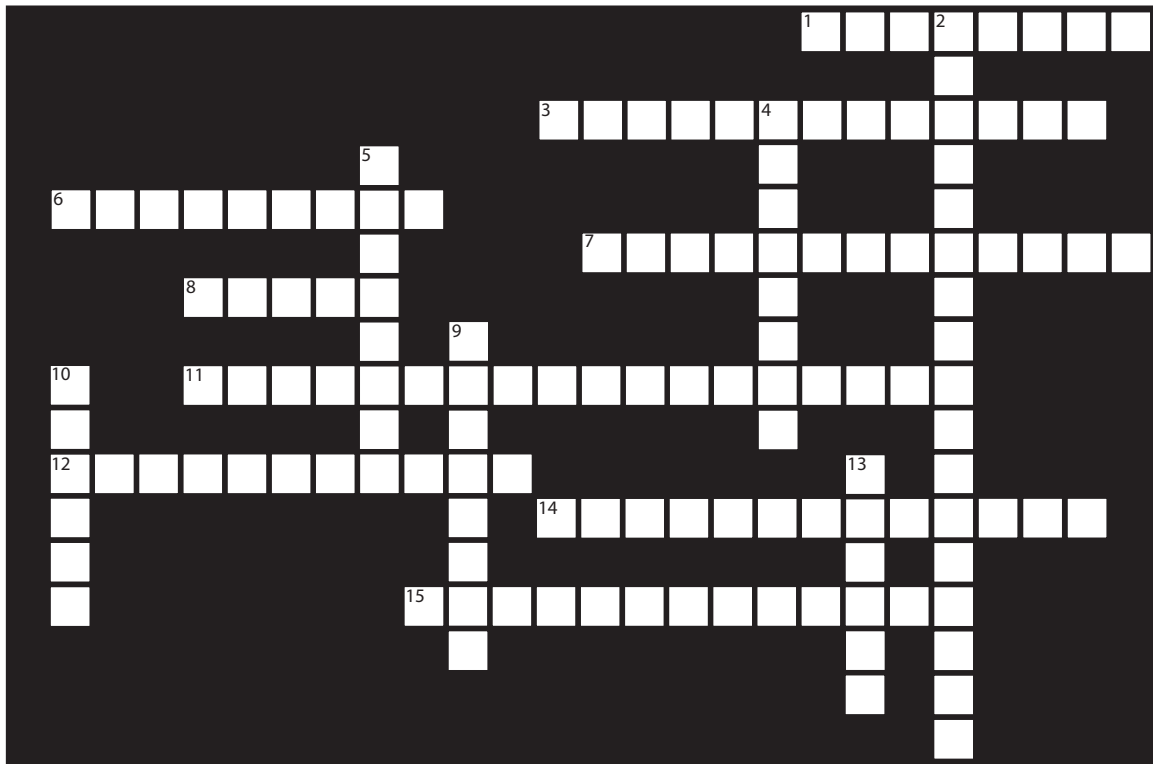
- a. $A = 32^\circ$, $B = 58^\circ$, $c = 28.3$ cm
- b. $A = 58^\circ$, $B = 32^\circ$, $c = 28.3$ cm
- c. $A = 39^\circ$, $B = 51^\circ$, $c = 28.3$ cm
- d. $A = 51^\circ$, $B = 39^\circ$, $c = 28.3$ cm

15. Solve the following triangle, where $b = 21.9$ cm and $B = 49^\circ$. (Triangle is not drawn to scale.)



- a. $A = 41^\circ$, $a = 25$ cm, $c = 33$ cm
- b. $A = 41^\circ$, $a = 19$ cm, $c = 29$ cm
- c. $A = 41^\circ$, $a = 14$ cm, $c = 26$ cm
- d. $A = 41^\circ$, $a = 19$ cm, $c = 33$ cm

Angle Relationships Crossword



Across

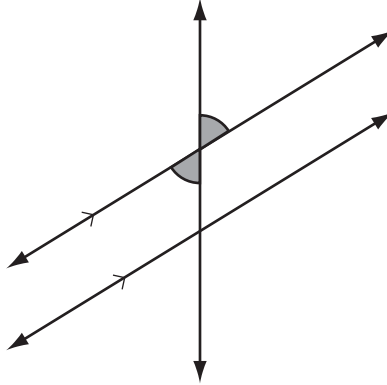
1. Angles which share a common vertex and lie on opposite sides of a common arm
3. Two angles with measures that add up to 90°
6. Angles with the same measure
7. Congruent angles in the same relative positions when two lines are intersected a transversal
8. An angle having a measure greater than 0° but less than 90°
11. Angles lying across from each other at the point where two lines intersect (2 words)
12. A line that cuts across two or more lines
14. Two angles with measures that add up to 180°
15. Lines that intersect at a 90° angle

Down

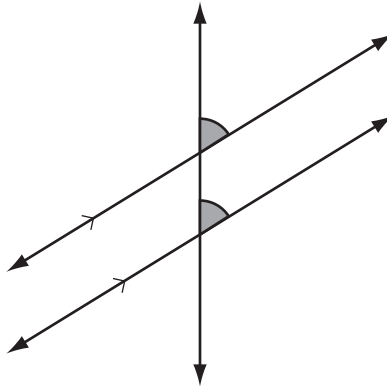
2. Interior angles lying on opposite sides of the transversal. One is on the left and the other is on the right. (2 words)
4. Angles outside two lines cut by a transversal
5. Angles lying between two lines cut by a transversal
9. Lines that never meet
10. An angle having a measure greater than 90° but less than 180°
13. An angle having a measure greater than 180° but less than 360°

Angle Relationships

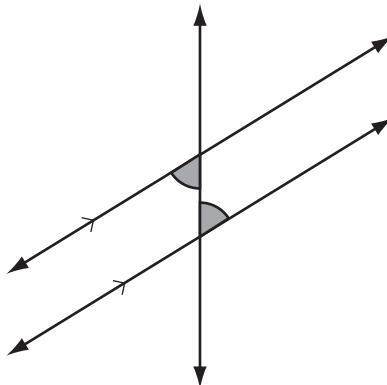
Vertically Opposite Angles (Congruent)



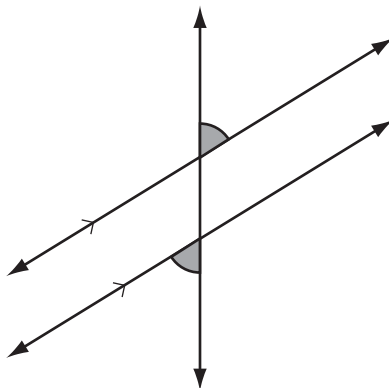
Corresponding Angles (Congruent)



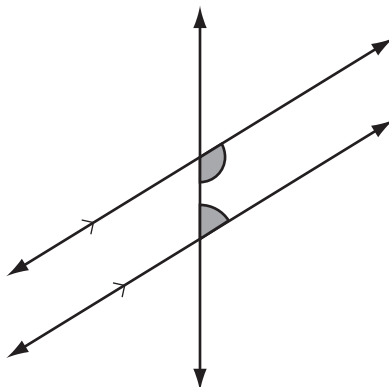
Alternate Interior Angles (Congruent)



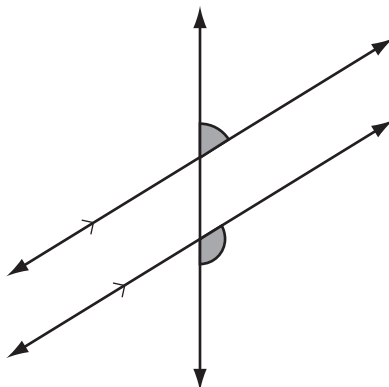
Alternate Exterior Angles (Congruent)



Co-interior Angles (Supplementary)



Co-exterior Angles (Supplementary)

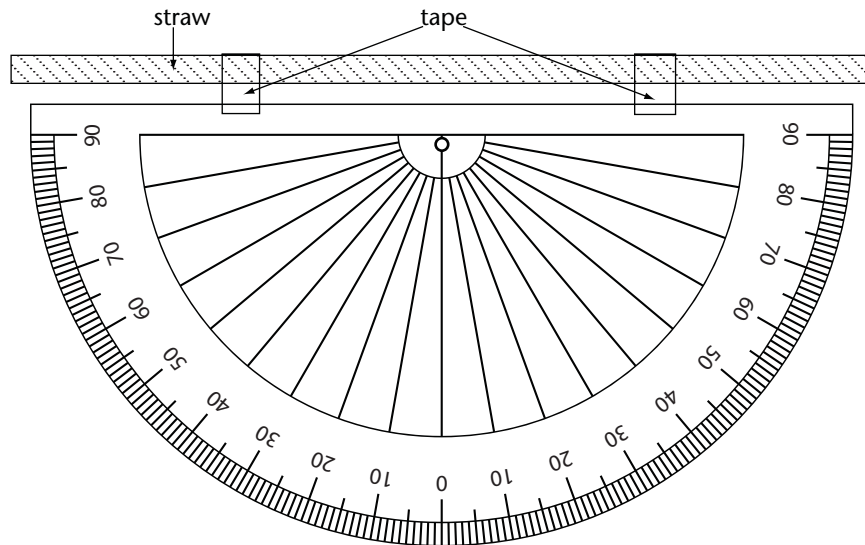


Build a Clinometer

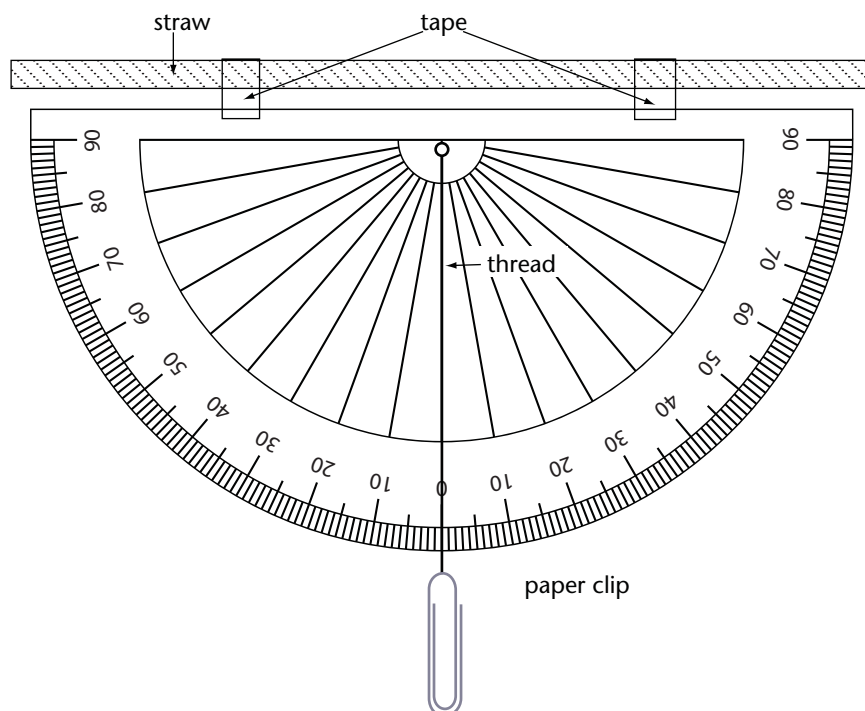
Step 1: Get the “Clinometer Template” from the appendix, and cut it out.

Step 2: Glue the template to a sheet of cardboard. Then, cut out the semicircular protractor.

Step 3: Tape a drinking straw to the base of the protractor as shown.

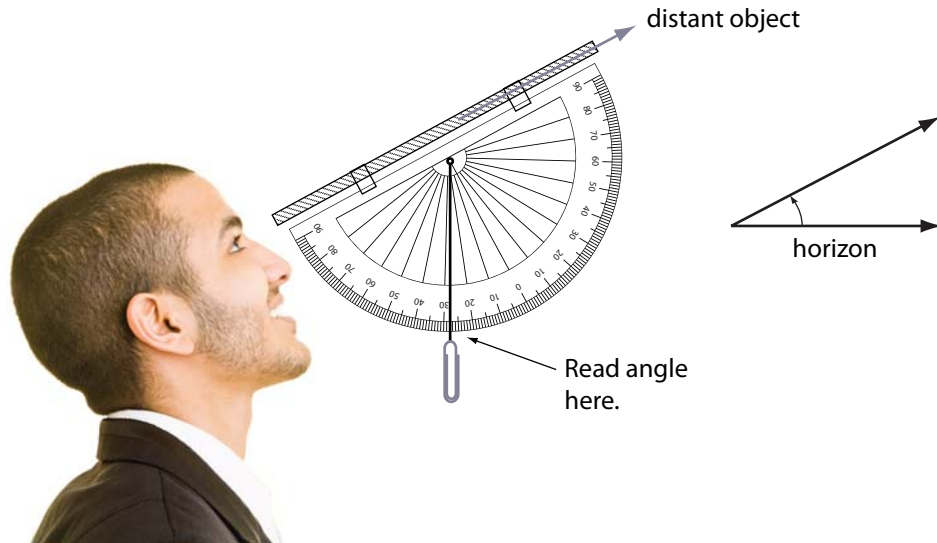


Step 4: Poke a small hole through the crosshairs at the centre of the protractor's base. Pass one end of your thread through the hole. Knot and tape that end of the thread so it will not slip back through. Tie a weight (such as a paper clip) to the free end of the thread.

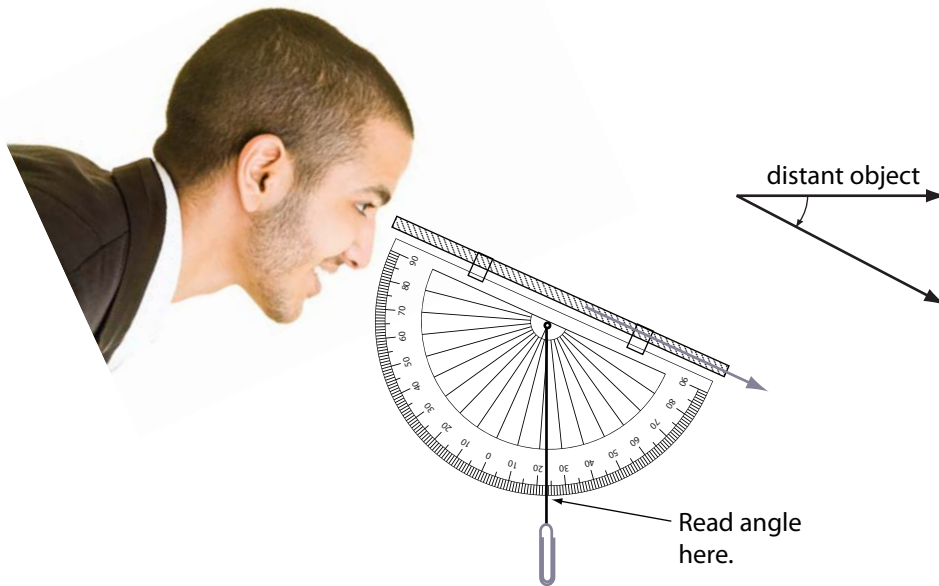


Step 5: Let the weight swing free. When the straw is horizontal, the thread should lie along the zero degree line as shown in the diagram.

When you look through the straw at an object higher than you are, your partner should be able to read the **angle of elevation**. When the weight hangs down and is motionless, the string will lie along a particular angle. This is the angle of elevation.

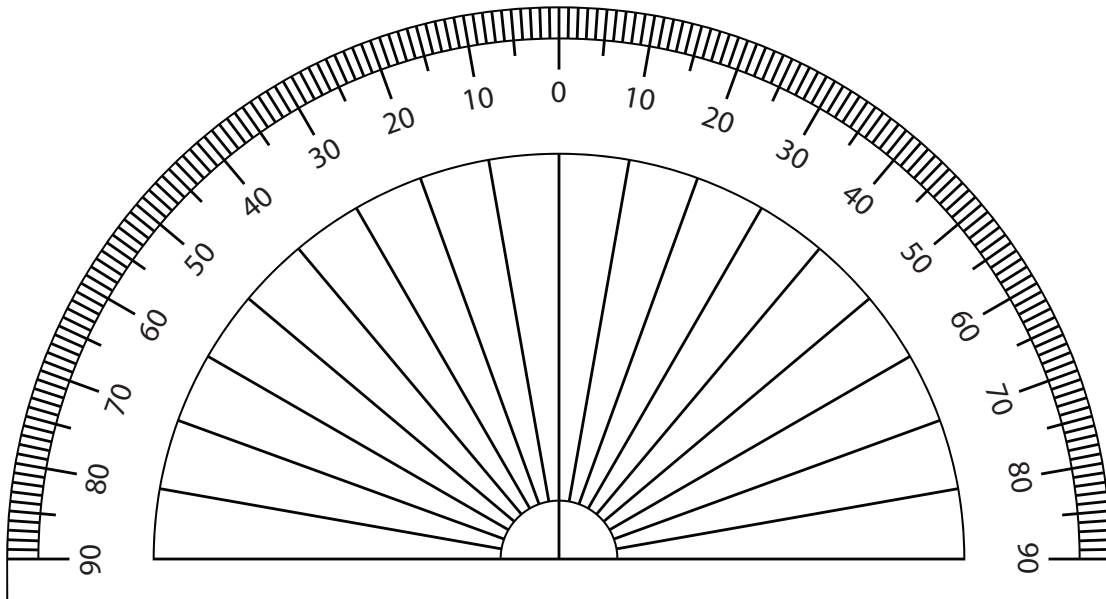


When you look through the straw at an object lower than you are, your partner should be able to read the angle of depression from the scale when the weight hangs down motionlessly.

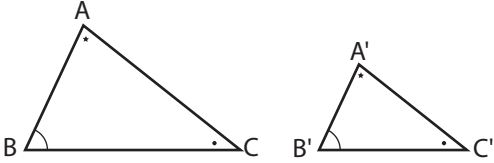
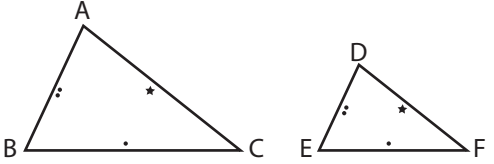
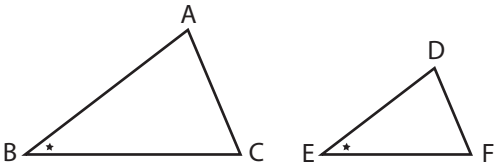


Practise looking through the straw and measuring angles of elevation and depression.

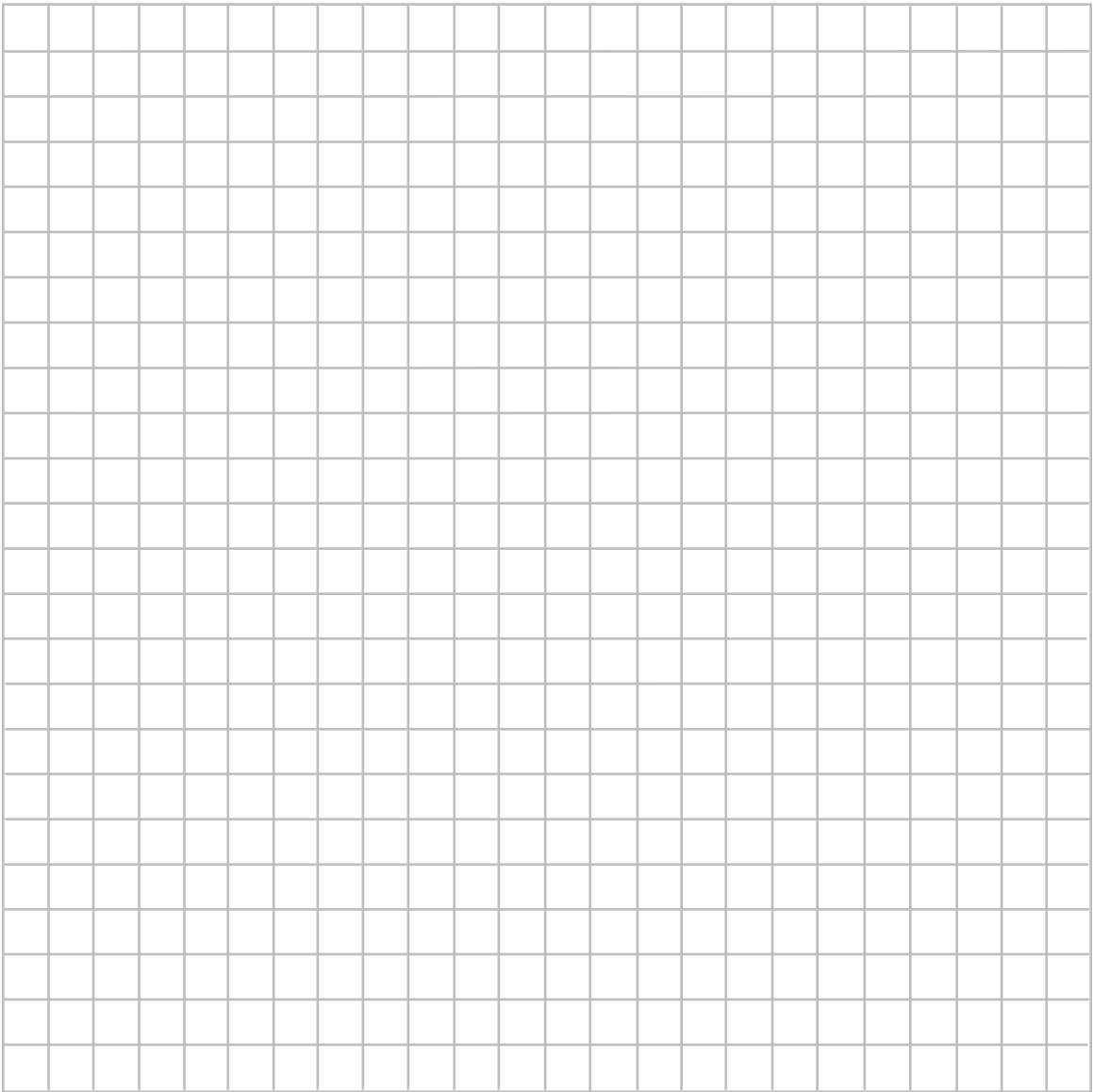
Clinometer Template

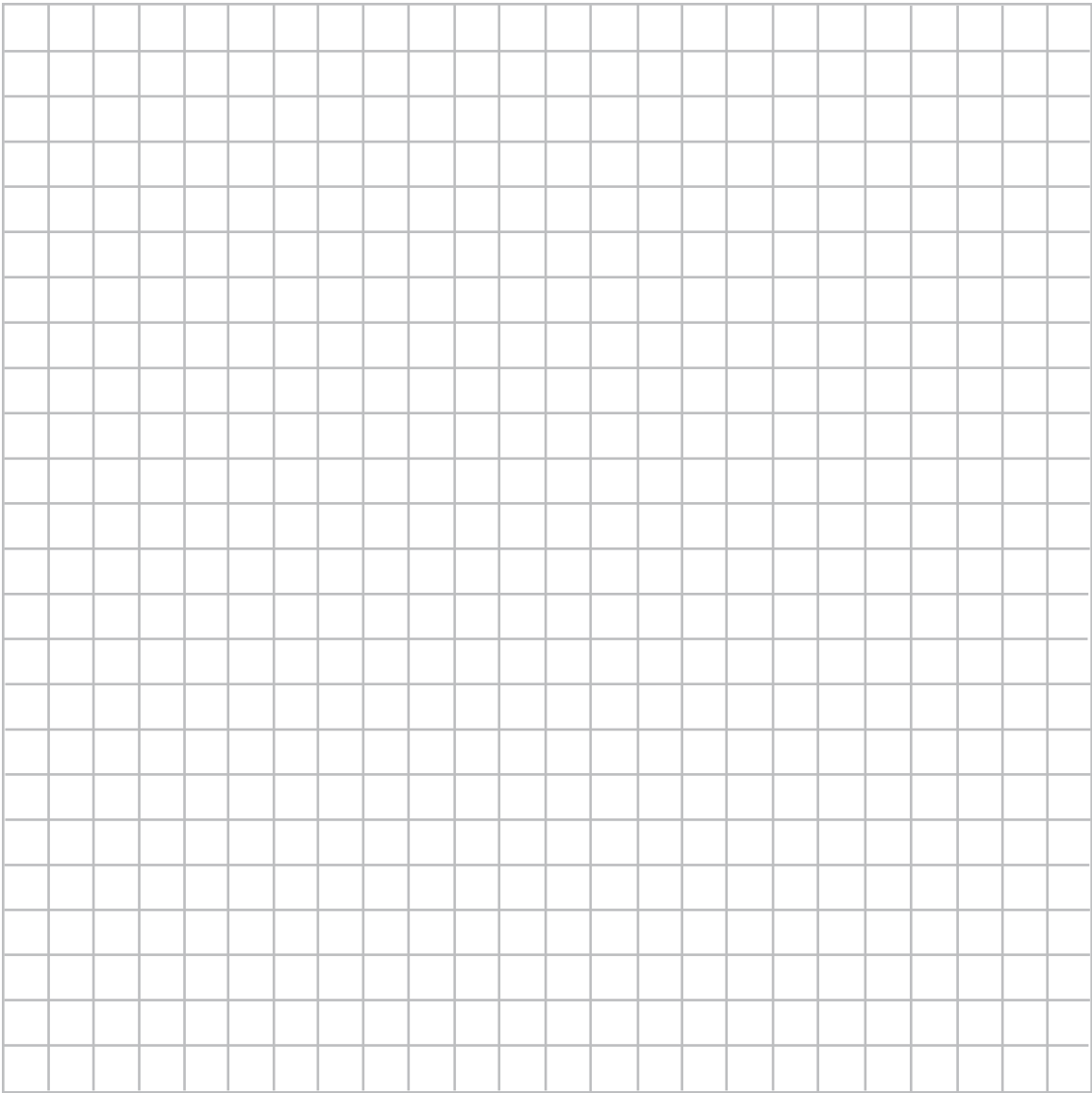


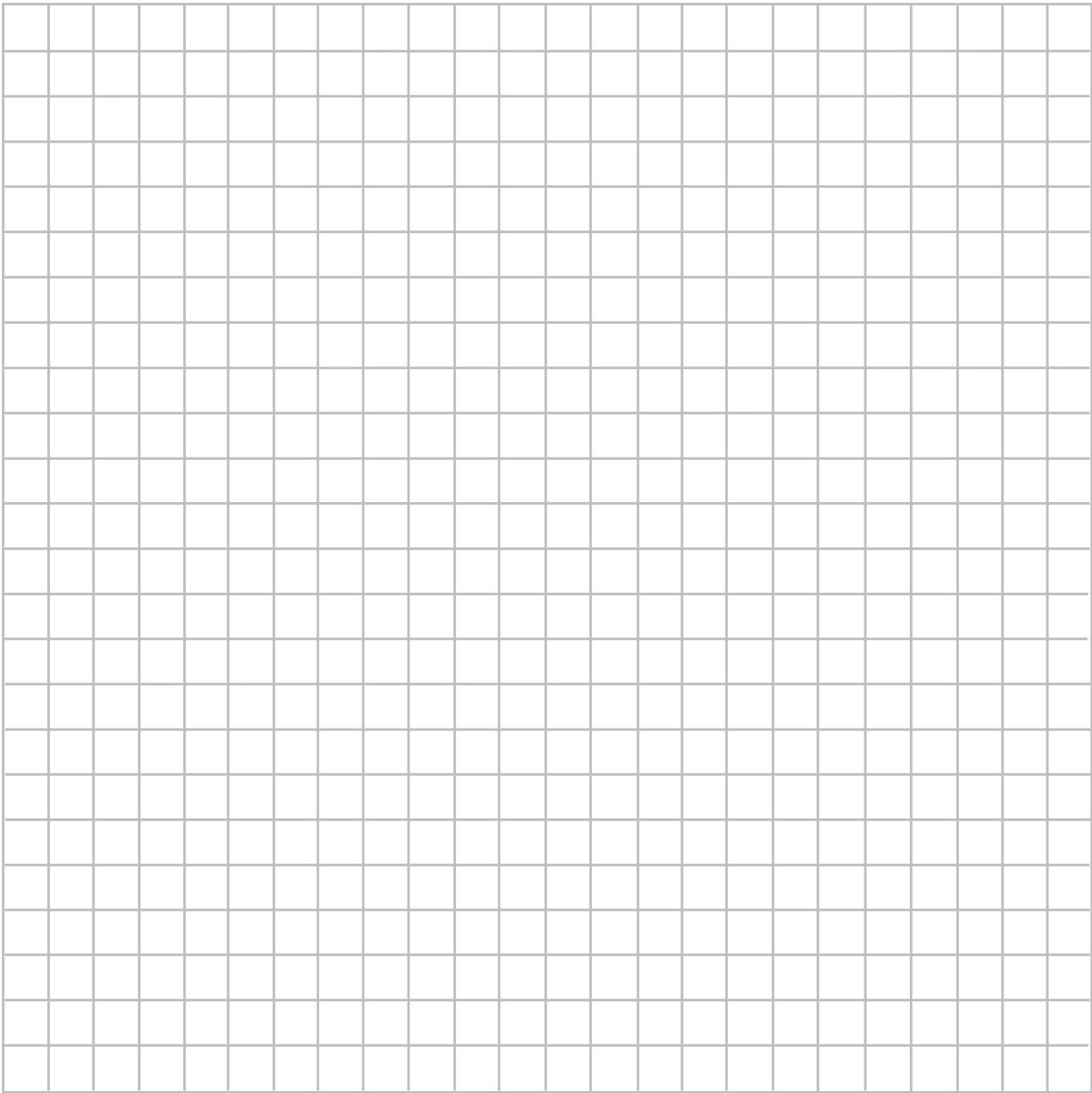
Conditions for Triangle Similarity

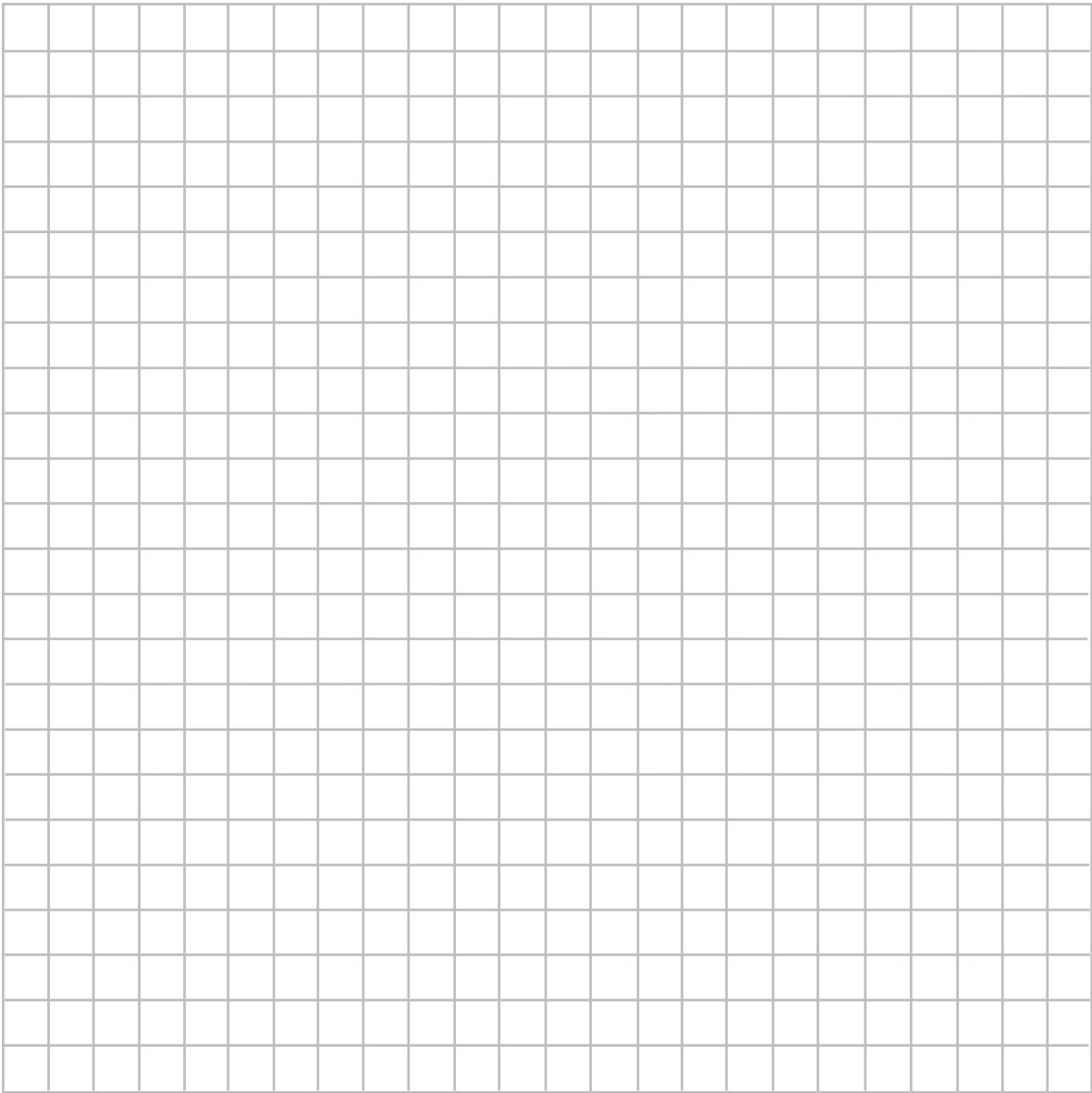
Graphic Representation	Description in Words	Symbolic Description	Nickname
Condition 1 	If the corresponding angles of two triangles are equal in measure, then the triangles are similar.	In the diagram, if $\angle A \cong \angle A'$, $\angle B \cong \angle B'$, and $\angle C \cong \angle C'$, then $\triangle ABC \sim \triangle A'B'C'$.	AAA Similarity
Condition 2 	If the corresponding sides of two triangles are proportional, the triangles are similar.	In the diagram, if $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$, then $\triangle ABC \sim \triangle DEF$.	SSS Similarity
Condition 3 	If two pairs of sides of two triangles are proportional, and the angles between those pairs of sides are congruent, the triangles are similar.	If, in the diagram, $\frac{AB}{DE} = \frac{AC}{DF}$ and $\angle A \cong \angle D$, then $\triangle ABC \sim \triangle DEF$.	SAS Similarity

Grid Paper

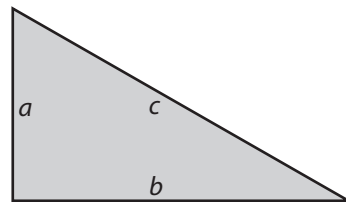
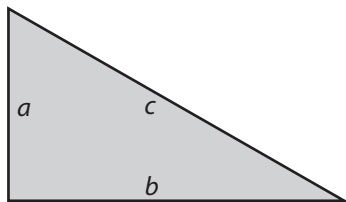
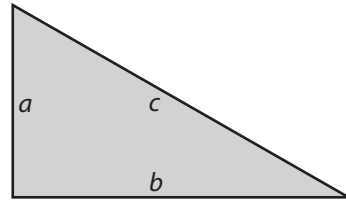
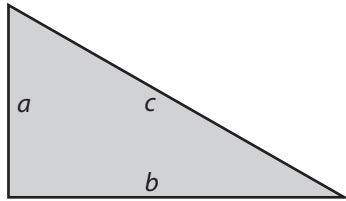




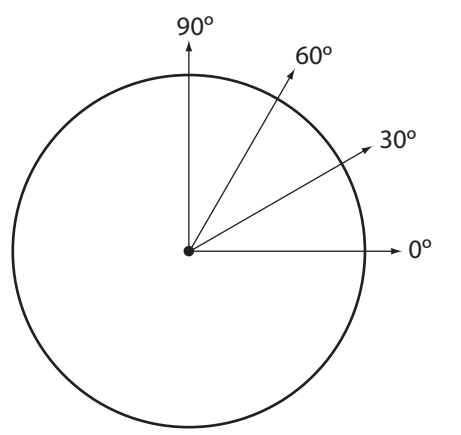
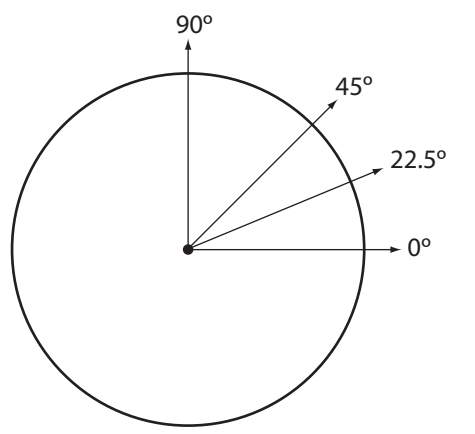




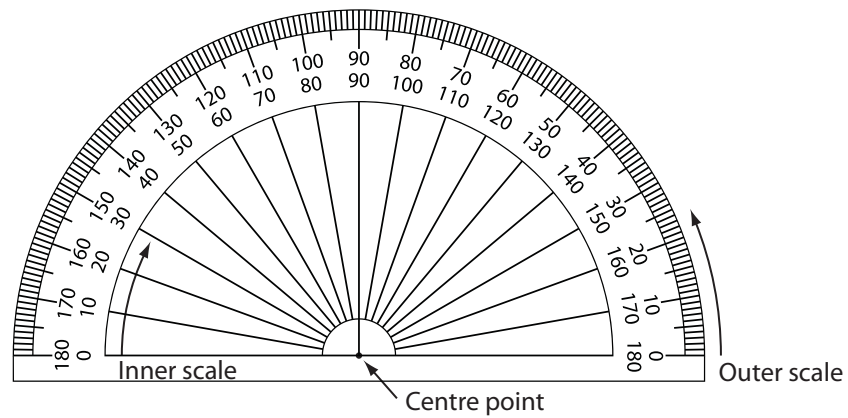
Pythagorean Theorem Proof Template



Referent Angles



Using a Protractor



The two scales on your protractor are used to measure angles drawn in different orientations. Remember, line up the centre-point of the protractor with the angle's vertex. Then start at zero on one of the protractor's scales. Both of the angles pictured below measure 30° .

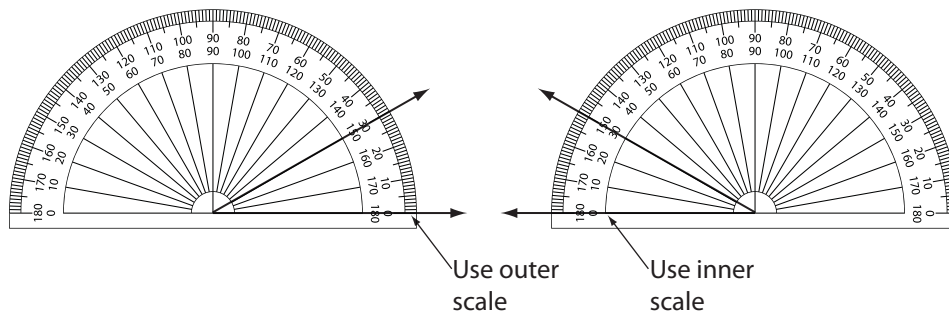


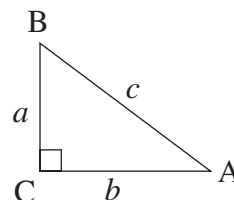
TABLE OF CONVERSIONS

1 inch	≈	2.54 centimetres
1 foot	≈	30.5 centimetres
1 foot	≈	0.305 metres
1 foot	=	12 inches
1 yard	=	3 feet
1 yard	≈	0.915 metres
1 mile	=	1760 yards
1 mile	≈	1.6 kilometres
1 kilogram	≈	2.2 pounds
1 litre	≈	1.06 US quarts
1 litre	≈	0.26 US gallons
1 gallon	≈	4 quarts
1 British gallon	≈	$\frac{6}{5}$ US gallon

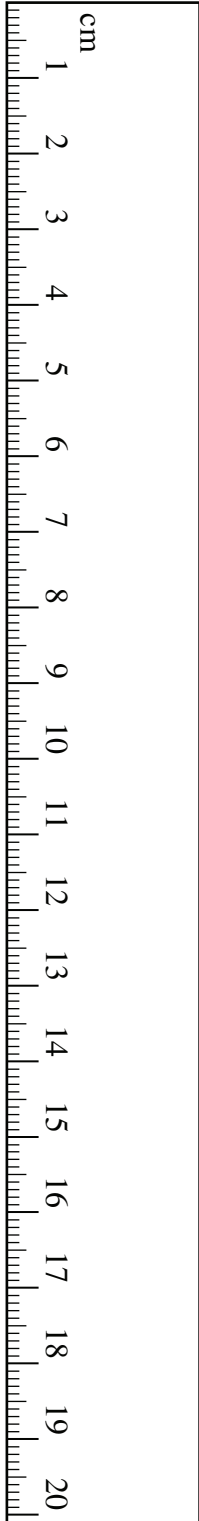
FORMULAE

Temperature
$C = \frac{5}{9}(F - 32)$

Trigonometry
(Put your calculator in Degree Mode) Right triangles <i>Pythagorean Theorem</i> $a^2 + b^2 = c^2$ $\sin A = \frac{\text{opposite}}{\text{hypotenuse}}$ $\cos A = \frac{\text{adjacent}}{\text{hypotenuse}}$ $\tan A = \frac{\text{opposite}}{\text{adjacent}}$



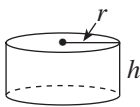
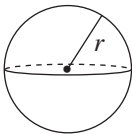
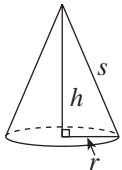
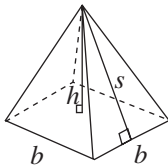
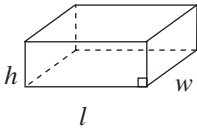
GEOMETRIC FORMULAE

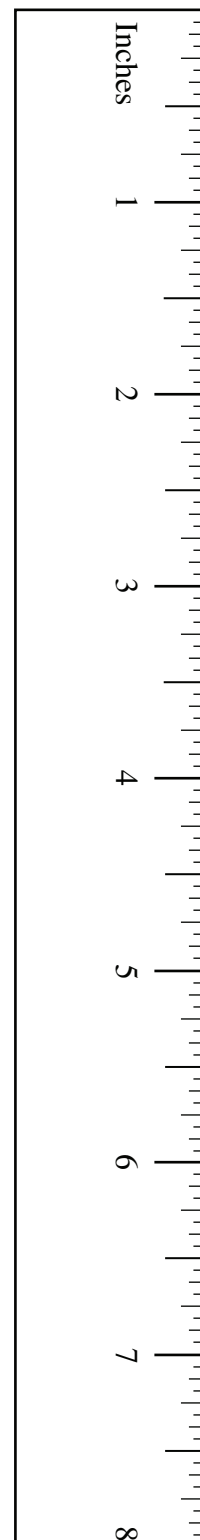


Key Legend	
l = length w = width b = base h = height s = slant height r = radius d = diameter	P = perimeter C = circumference A = area SA = surface area V = volume

Geometric Figure	Perimeter	Area
Rectangle 	$P = 2l + 2w$ or $P = 2(l + w)$	$A = lw$
Triangle 	$P = a + b + c$	$A = \frac{bh}{2}$
Circle 	$C = \pi d$ or $C = 2\pi r$	$A = \pi r^2$

Note: Use the value of π programmed in your calculator rather than the approximation of 3.14.

Geometric Figure	Surface Area
Cylinder 	$A_{top} = \pi r^2$ $A_{base} = \pi r^2$ $A_{side} = 2\pi rh$ $SA = 2\pi r^2 + 2\pi rh$
Sphere 	$SA = 4\pi r^2$ or $SA = \pi d^2$
Cone 	$A_{side} = \pi rs$ $A_{base} = \pi r^2$ $SA = \pi r^2 + \pi rs$
Square-Based Pyramid 	$A_{triangle} = \frac{1}{2}bs$ (for each triangle) $A_{base} = b^2$ $SA = 2bs + b^2$
Rectangular Prism 	$SA = wh + wh + lw + lw + lh + lh$ or $SA = 2(wh + lw + lh)$
General Right Prism	$SA =$ the sum of the areas of all the faces
General Pyramid	$SA =$ the sum of the areas of all the faces



Note: Use the value of π programmed in your calculator rather than the approximation of 3.14.

**Canada Pension Plan Contributions
Weekly (52 pay periods a year)**

**Cotisations au Régime de pensions du Canada
Hebdomadaire (52 périodes de paie par année)**

Pay Rémunération			Pay Rémunération			Pay Rémunération			Pay Rémunération		
From - De	To - À	CPP RPC	From - De	To - À	CPP RPC	From - De	To - À	CPP RPC	From - De	To - À	CPP RPC
358.11 -	358.31	14.40	372.66 -	372.85	15.12	387.20 -	387.40	15.84	401.75 -	401.94	16.56
358.32 -	358.51	14.41	372.86 -	373.05	15.13	387.41 -	387.60	15.85	401.95 -	402.14	16.57
358.52 -	358.71	14.42	373.06 -	373.25	15.14	387.61 -	387.80	15.86	402.15 -	402.35	16.58
358.72 -	358.91	14.43	373.26 -	373.46	15.15	387.81 -	388.00	15.87	402.36 -	402.55	16.59
358.92 -	359.11	14.44	373.47 -	373.66	15.16	388.01 -	388.20	15.88	402.56 -	402.75	16.60
359.12 -	359.32	14.45	373.67 -	373.86	15.17	388.21 -	388.41	15.89	402.76 -	402.95	16.61
359.33 -	359.52	14.46	373.87 -	374.06	15.18	388.42 -	388.61	15.90	402.96 -	403.15	16.62
359.53 -	359.72	14.47	374.07 -	374.26	15.19	388.62 -	388.81	15.91	403.16 -	403.36	16.63
359.73 -	359.92	14.48	374.27 -	374.47	15.20	388.82 -	389.01	15.92	403.37 -	403.56	16.64
359.93 -	360.12	14.49	374.48 -	374.67	15.21	389.02 -	389.21	15.93	403.57 -	403.76	16.65
360.13 -	360.33	14.50	374.68 -	374.87	15.22	389.22 -	389.42	15.94	403.77 -	403.96	16.66
360.34 -	360.53	14.51	374.88 -	375.07	15.23	389.43 -	389.62	15.95	403.97 -	404.16	16.67
360.54 -	360.73	14.52	375.08 -	375.27	15.24	389.63 -	389.82	15.96	404.17 -	404.37	16.68
360.74 -	360.93	14.53	375.28 -	375.48	15.25	389.83 -	390.02	15.97	404.38 -	404.57	16.69
360.94 -	361.13	14.54	375.49 -	375.68	15.26	390.03 -	390.22	15.98	404.58 -	404.77	16.70
361.14 -	361.34	14.55	375.69 -	375.88	15.27	390.23 -	390.43	15.99	404.78 -	404.97	16.71
361.35 -	361.54	14.56	375.89 -	376.08	15.28	390.44 -	390.63	16.00	404.98 -	405.17	16.72
361.55 -	361.74	14.57	376.09 -	376.28	15.29	390.64 -	390.83	16.01	405.18 -	405.38	16.73
361.75 -	361.94	14.58	376.29 -	376.49	15.30	390.84 -	391.03	16.02	405.39 -	405.58	16.74
361.95 -	362.14	14.59	376.50 -	376.69	15.31	391.04 -	391.23	16.03	405.59 -	405.78	16.75
362.15 -	362.35	14.60	376.70 -	376.89	15.32	391.24 -	391.44	16.04	405.79 -	405.98	16.76
362.36 -	362.55	14.61	376.90 -	377.09	15.33	391.45 -	391.64	16.05	405.99 -	406.18	16.77
362.56 -	362.75	14.62	377.10 -	377.29	15.34	391.65 -	391.84	16.06	406.19 -	406.39	16.78
362.76 -	362.95	14.63	377.30 -	377.50	15.35	391.85 -	392.04	16.07	406.40 -	406.59	16.79
362.96 -	363.15	14.64	377.51 -	377.70	15.36	392.05 -	392.24	16.08	406.60 -	406.79	16.80
363.16 -	363.36	14.65	377.71 -	377.90	15.37	392.25 -	392.45	16.09	406.80 -	406.99	16.81
363.37 -	363.56	14.66	377.91 -	378.10	15.38	392.46 -	392.65	16.10	407.00 -	407.19	16.82
363.57 -	363.76	14.67	378.11 -	378.31	15.39	392.66 -	392.85	16.11	407.20 -	407.40	16.83
363.77 -	363.96	14.68	378.32 -	378.51	15.40	392.86 -	393.05	16.12	407.41 -	407.60	16.84
363.97 -	364.16	14.69	378.52 -	378.71	15.41	393.06 -	393.25	16.13	407.61 -	407.80	16.85
364.17 -	364.37	14.70	378.72 -	378.91	15.42	393.26 -	393.46	16.14	407.81 -	408.00	16.86
364.38 -	364.57	14.71	378.92 -	379.11	15.43	393.47 -	393.66	16.15	408.01 -	408.20	16.87
364.58 -	364.77	14.72	379.12 -	379.32	15.44	393.67 -	393.86	16.16	408.21 -	408.41	16.88
364.78 -	364.97	14.73	379.33 -	379.52	15.45	393.87 -	394.06	16.17	408.42 -	408.61	16.89
364.98 -	365.17	14.74	379.53 -	379.72	15.46	394.07 -	394.26	16.18	408.62 -	408.81	16.90
365.18 -	365.38	14.75	379.73 -	379.92	15.47	394.27 -	394.47	16.19	408.82 -	409.01	16.91
365.39 -	365.58	14.76	379.93 -	380.12	15.48	394.48 -	394.67	16.20	409.02 -	409.21	16.92
365.59 -	365.78	14.77	380.13 -	380.33	15.49	394.68 -	394.87	16.21	409.22 -	409.42	16.93
365.79 -	365.98	14.78	380.34 -	380.53	15.50	394.88 -	395.07	16.22	409.43 -	409.62	16.94
365.99 -	366.18	14.79	380.54 -	380.73	15.51	395.08 -	395.27	16.23	409.63 -	409.82	16.95
366.19 -	366.39	14.80	380.74 -	380.93	15.52	395.28 -	395.48	16.24	409.83 -	410.02	16.96
366.40 -	366.59	14.81	380.94 -	381.13	15.53	395.49 -	395.68	16.25	410.03 -	410.22	16.97
366.60 -	366.79	14.82	381.14 -	381.34	15.54	395.69 -	395.88	16.26	410.23 -	410.43	16.98
366.80 -	366.99	14.83	381.35 -	381.54	15.55	395.89 -	396.08	16.27	410.44 -	410.63	16.99
367.00 -	367.19	14.84	381.55 -	381.74	15.56	396.09 -	396.28	16.28	410.64 -	410.83	17.00
367.20 -	367.40	14.85	381.75 -	381.94	15.57	396.29 -	396.49	16.29	410.84 -	411.03	17.01
367.41 -	367.60	14.86	381.95 -	382.14	15.58	396.50 -	396.69	16.30	411.04 -	411.23	17.02
367.61 -	367.80	14.87	382.15 -	382.35	15.59	396.70 -	396.89	16.31	411.24 -	411.44	17.03
367.81 -	368.00	14.88	382.36 -	382.55	15.60	396.90 -	397.09	16.32	411.45 -	411.64	17.04
368.01 -	368.20	14.89	382.56 -	382.75	15.61	397.10 -	397.29	16.33	411.65 -	411.84	17.05
368.21 -	368.41	14.90	382.76 -	382.95	15.62	397.30 -	397.50	16.34	411.85 -	412.04	17.06
368.42 -	368.61	14.91	382.96 -	383.15	15.63	397.51 -	397.70	16.35	412.05 -	412.24	17.07
368.62 -	368.81	14.92	383.16 -	383.36	15.64	397.71 -	397.90	16.36	412.25 -	412.45	17.08
368.82 -	369.01	14.93	383.37 -	383.56	15.65	397.91 -	398.10	16.37	412.46 -	412.65	17.09
369.02 -	369.21	14.94	383.57 -	383.76	15.66	398.11 -	398.31	16.38	412.66 -	412.85	17.10
369.22 -	369.42	14.95	383.77 -	383.96	15.67	398.32 -	398.51	16.39	412.86 -	413.05	17.11
369.43 -	369.62	14.96	383.97 -	384.16	15.68	398.52 -	398.71	16.40	413.06 -	413.25	17.12
369.63 -	369.82	14.97	384.17 -	384.37	15.69	398.72 -	398.91	16.41	413.26 -	413.46	17.13
369.83 -	370.02	14.98	384.38 -	384.57	15.70	398.92 -	399.11	16.42	413.47 -	413.66	17.14
370.03 -	370.22	14.99	384.58 -	384.77	15.71	399.12 -	399.32	16.43	413.67 -	413.86	17.15
370.23 -	370.43	15.00	384.78 -	384.97	15.72	399.33 -	399.52	16.44	413.87 -	414.06	17.16
370.44 -	370.63	15.01	384.98 -	385.17	15.73	399.53 -	399.72	16.45	414.07 -	414.26	17.17
370.64 -	370.83	15.02	385.18 -	385.38	15.74	399.73 -	399.92	16.46	414.27 -	414.47	17.18
370.84 -	371.03	15.03	385.39 -	385.58	15.75	399.93 -	400.12	16.47	414.48 -	414.67	17.19
371.04 -	371.23	15.04	385.59 -	385.78	15.76	400.13 -	400.33	16.48	414.68 -	414.87	17.20
371.24 -	371.44	15.05	385.79 -	385.98	15.77	400.34 -	400.53	16.49	414.88 -	415.07	17.21
371.45 -	371.64	15.06	385.99 -	386.18	15.78	400.54 -	400.73	16.50	415.08 -	415.27	17.22
371.65 -	371.84	15.07	386.19 -	386.39	15.79	400.74 -	400.93	16.51	415.28 -	415.48	17.23
371.85 -	372.04	15.08	386.40 -	386.59	15.80	400.94 -	401.13	16.52	415.49 -	415.68	17.24
372.05 -	372.24	15.09	386.60 -	386.79	15.81	401.14 -	401.34	16.53	415.69 -	415.88	17.25
372.25 -	372.45	15.10	386.80 -	386.99	15.82	401.35 -	401.54	16.54	415.89 -	416.08	17.26
372.46 -	372.65	15.11	387.00 -	387.19	15.83	401.55 -	401.74	16.55	416.09 -	416.28	17.27

Employee's maximum CPP contribution for the year 2009 is \$2,118.60

B-6

La cotisation maximale de l'employé au RPC pour l'année 2009 est de 2 118,60 \$

Employment Insurance Premiums

Cotisations à l'assurance-emploi

Insurable Earnings Rémunération assurable		El premium Cotisation d'AE	Insurable Earnings Rémunération assurable		El premium Cotisation d'AE	Insurable Earnings Rémunération assurable		El premium Cotisation d'AE	Insurable Earnings Rémunération assurable		El premium Cotisation d'AE
From - De	To - À		From - De	To - À		From - De	To - À		From - De	To - À	
333.24	- 333.81	5.77	374.86	- 375.43	6.49	416.48	- 417.05	7.21	458.10	- 458.67	7.93
333.82	- 334.39	5.78	375.44	- 376.01	6.50	417.06	- 417.63	7.22	458.68	- 459.24	7.94
334.40	- 334.97	5.79	376.02	- 376.58	6.51	417.64	- 418.20	7.23	459.25	- 459.82	7.95
334.98	- 335.54	5.80	376.59	- 377.16	6.52	418.21	- 418.78	7.24	459.83	- 460.40	7.96
335.55	- 336.12	5.81	377.17	- 377.74	6.53	418.79	- 419.36	7.25	460.41	- 460.98	7.97
336.13	- 336.70	5.82	377.75	- 378.32	6.54	419.37	- 419.94	7.26	460.99	- 461.56	7.98
336.71	- 337.28	5.83	378.33	- 378.90	6.55	419.95	- 420.52	7.27	461.57	- 462.13	7.99
337.29	- 337.86	5.84	378.91	- 379.47	6.56	420.53	- 421.09	7.28	462.14	- 462.71	8.00
337.87	- 338.43	5.85	379.48	- 380.05	6.57	421.10	- 421.67	7.29	462.72	- 463.29	8.01
338.44	- 339.01	5.86	380.06	- 380.63	6.58	421.68	- 422.25	7.30	463.30	- 463.87	8.02
339.02	- 339.59	5.87	380.64	- 381.21	6.59	422.26	- 422.83	7.31	463.88	- 464.45	8.03
339.60	- 340.17	5.88	381.22	- 381.79	6.60	422.84	- 423.41	7.32	464.46	- 465.02	8.04
340.18	- 340.75	5.89	381.80	- 382.36	6.61	423.42	- 423.98	7.33	465.03	- 465.60	8.05
340.76	- 341.32	5.90	382.37	- 382.94	6.62	423.99	- 424.56	7.34	465.61	- 466.18	8.06
341.33	- 341.90	5.91	382.95	- 383.52	6.63	424.57	- 425.14	7.35	466.19	- 466.76	8.07
341.91	- 342.48	5.92	383.53	- 384.10	6.64	425.15	- 425.72	7.36	466.77	- 467.34	8.08
342.49	- 343.06	5.93	384.11	- 384.68	6.65	425.73	- 426.30	7.37	467.35	- 467.91	8.09
343.07	- 343.64	5.94	384.69	- 385.26	6.66	426.31	- 426.87	7.38	467.92	- 468.49	8.10
343.65	- 344.21	5.95	385.27	- 385.83	6.67	426.88	- 427.45	7.39	468.50	- 469.07	8.11
344.22	- 344.79	5.96	385.84	- 386.41	6.68	427.46	- 428.03	7.40	469.08	- 469.65	8.12
344.80	- 345.37	5.97	386.42	- 386.99	6.69	428.04	- 428.61	7.41	469.66	- 470.23	8.13
345.38	- 345.95	5.98	387.00	- 387.57	6.70	428.62	- 429.19	7.42	470.24	- 470.80	8.14
345.96	- 346.53	5.99	387.58	- 388.15	6.71	429.20	- 429.76	7.43	470.81	- 471.38	8.15
346.54	- 347.10	6.00	388.16	- 388.72	6.72	429.77	- 430.34	7.44	471.39	- 471.96	8.16
347.11	- 347.68	6.01	388.73	- 389.30	6.73	430.35	- 430.92	7.45	471.97	- 472.54	8.17
347.69	- 348.26	6.02	389.31	- 389.88	6.74	430.93	- 431.50	7.46	472.55	- 473.12	8.18
348.27	- 348.84	6.03	389.89	- 390.46	6.75	431.51	- 432.08	7.47	473.13	- 473.69	8.19
348.85	- 349.42	6.04	390.47	- 391.04	6.76	432.09	- 432.65	7.48	473.70	- 474.27	8.20
349.43	- 349.99	6.05	391.05	- 391.61	6.77	432.66	- 433.23	7.49	474.28	- 474.85	8.21
350.00	- 350.57	6.06	391.62	- 392.19	6.78	433.24	- 433.81	7.50	474.86	- 475.43	8.22
350.58	- 351.15	6.07	392.20	- 392.77	6.79	433.82	- 434.39	7.51	475.44	- 476.01	8.23
351.16	- 351.73	6.08	392.78	- 393.35	6.80	434.40	- 434.97	7.52	476.02	- 476.58	8.24
351.74	- 352.31	6.09	393.36	- 393.93	6.81	434.98	- 435.54	7.53	476.59	- 477.16	8.25
352.32	- 352.89	6.10	393.94	- 394.50	6.82	435.55	- 436.12	7.54	477.17	- 477.74	8.26
352.90	- 353.46	6.11	394.51	- 395.08	6.83	436.13	- 436.70	7.55	477.75	- 478.32	8.27
353.47	- 354.04	6.12	395.09	- 395.66	6.84	436.71	- 437.28	7.56	478.33	- 478.90	8.28
354.05	- 354.62	6.13	395.67	- 396.24	6.85	437.29	- 437.86	7.57	478.91	- 479.47	8.29
354.63	- 355.20	6.14	396.25	- 396.82	6.86	437.87	- 438.43	7.58	479.48	- 480.05	8.30
355.21	- 355.78	6.15	396.83	- 397.39	6.87	438.44	- 439.01	7.59	480.06	- 480.63	8.31
355.79	- 356.35	6.16	397.40	- 397.97	6.88	439.02	- 439.59	7.60	480.64	- 481.21	8.32
356.36	- 356.93	6.17	397.98	- 398.55	6.89	439.60	- 440.17	7.61	481.22	- 481.79	8.33
356.94	- 357.51	6.18	398.56	- 399.13	6.90	440.18	- 440.75	7.62	481.80	- 482.36	8.34
357.52	- 358.09	6.19	399.14	- 399.71	6.91	440.76	- 441.32	7.63	482.37	- 482.94	8.35
358.10	- 358.67	6.20	399.72	- 400.28	6.92	441.33	- 441.90	7.64	482.95	- 483.52	8.36
358.68	- 359.24	6.21	400.29	- 400.86	6.93	441.91	- 442.48	7.65	483.53	- 484.10	8.37
359.25	- 359.82	6.22	400.87	- 401.44	6.94	442.49	- 443.06	7.66	484.11	- 484.68	8.38
359.83	- 360.40	6.23	401.45	- 402.02	6.95	443.07	- 443.64	7.67	484.69	- 485.26	8.39
360.41	- 360.98	6.24	402.03	- 402.60	6.96	443.65	- 444.21	7.68	485.27	- 485.83	8.40
360.99	- 361.56	6.25	402.61	- 403.17	6.97	444.22	- 444.79	7.69	485.84	- 486.41	8.41
361.57	- 362.13	6.26	403.18	- 403.75	6.98	444.80	- 445.37	7.70	486.42	- 486.99	8.42
362.14	- 362.71	6.27	403.76	- 404.33	6.99	445.38	- 445.95	7.71	487.00	- 487.57	8.43
362.72	- 363.29	6.28	404.34	- 404.91	7.00	445.96	- 446.53	7.72	487.58	- 488.15	8.44
363.30	- 363.87	6.29	404.92	- 405.49	7.01	446.54	- 447.10	7.73	488.16	- 488.72	8.45
363.88	- 364.45	6.30	405.50	- 406.06	7.02	447.11	- 447.68	7.74	488.73	- 489.30	8.46
364.46	- 365.02	6.31	406.07	- 406.64	7.03	447.69	- 448.26	7.75	489.31	- 489.88	8.47
365.03	- 365.60	6.32	406.65	- 407.22	7.04	448.27	- 448.84	7.76	489.89	- 490.46	8.48
365.61	- 366.18	6.33	407.23	- 407.80	7.05	448.85	- 449.42	7.77	490.47	- 491.04	8.49
366.19	- 366.76	6.34	407.81	- 408.38	7.06	449.43	- 449.99	7.78	491.05	- 491.61	8.50
366.77	- 367.34	6.35	408.39	- 408.95	7.07	450.00	- 450.57	7.79	491.62	- 492.19	8.51
367.35	- 367.91	6.36	408.96	- 409.53	7.08	450.58	- 451.15	7.80	492.20	- 492.77	8.52
367.92	- 368.49	6.37	409.54	- 410.11	7.09	451.16	- 451.73	7.81	492.78	- 493.35	8.53
368.50	- 369.07	6.38	410.12	- 410.69	7.10	451.74	- 452.31	7.82	493.36	- 493.93	8.54
369.08	- 369.65	6.39	410.70	- 411.27	7.11	452.32	- 452.89	7.83	493.94	- 494.50	8.55
369.66	- 370.23	6.40	411.28	- 411.84	7.12	452.90	- 453.46	7.84	494.51	- 495.08	8.56
370.24	- 370.80	6.41	411.85	- 412.42	7.13	453.47	- 454.04	7.85	495.09	- 495.66	8.57
370.81	- 371.38	6.42	412.43	- 413.00	7.14	454.05	- 454.62	7.86	495.67	- 496.24	8.58
371.39	- 371.96	6.43	413.01	- 413.58	7.15	454.63	- 455.20	7.87	496.25	- 496.82	8.59
371.97	- 372.54	6.44	413.59	- 414.16	7.16	455.21	- 455.78	7.88	496.83	- 497.39	8.60
372.55	- 373.12	6.45	414.17	- 414.73	7.17	455.79	- 456.35	7.89	497.40	- 497.97	8.61
373.13	- 373.69	6.46	414.74	- 415.31	7.18	456.36	- 456.93	7.90	497.98	- 498.55	8.62
373.70	- 374.27	6.47	415.32	- 415.89	7.19	456.94	- 457.51	7.91	498.56	- 499.13	8.63
374.28	- 374.85	6.48	415.90	- 416.47	7.20	457.52	- 458.09	7.92	499.14	- 499.71	8.64

Yearly maximum insurable earnings are \$42,300
 Yearly maximum employee premiums are \$731.79
 The premium rate for 2009 is 1.73 %

Le maximum annuel de la rémunération assurable est de 42 300 \$
 La cotisation maximale annuelle de l'employé est de 731,79 \$
 Le taux de cotisation pour 2009 est de 1,73 %

Federal tax deductions
Effective January 1, 2009
Weekly (52 pay periods a year)
Also look up the tax deductions
in the provincial table

Retenues d'impôt fédéral
En vigueur le 1^{er} janvier 2009
Hebdomadaire (52 périodes de paie par année)
Cherchez aussi les retenues d'impôt
dans la table provinciale

Pay Rémunération		Federal claim codes/Codes de demande fédéraux									
		0	1	2	3	4	5	6	7	8	9
From	Less than	Deduct from each pay									
De	Moins de	Retenez sur chaque paie									
335	- 339	44.65	15.55	12.70	7.00	1.30					
339	- 343	45.20	16.10	13.25	7.55	1.85					
343	- 347	45.80	16.65	13.80	8.10	2.45					
347	- 351	46.35	17.20	14.35	8.65	3.00					
351	- 355	46.90	17.75	14.90	9.25	3.55					
355	- 359	47.45	18.35	15.50	9.80	4.10					
359	- 363	48.00	18.90	16.05	10.35	4.65					
363	- 367	48.60	19.45	16.60	10.90	5.25					
367	- 371	49.15	20.00	17.15	11.45	5.80	.10				
371	- 375	49.70	20.55	17.70	12.05	6.35	.65				
375	- 379	50.25	21.15	18.30	12.60	6.90	1.20				
379	- 383	50.80	21.70	18.85	13.15	7.45	1.80				
383	- 387	51.40	22.25	19.40	13.70	8.00	2.35				
387	- 391	51.95	22.80	19.95	14.25	8.60	2.90				
391	- 395	52.50	23.35	20.50	14.85	9.15	3.45				
395	- 399	53.05	23.95	21.10	15.40	9.70	4.00				
399	- 403	53.60	24.50	21.65	15.95	10.25	4.60				
403	- 407	54.20	25.05	22.20	16.50	10.80	5.15				
407	- 411	54.75	25.60	22.75	17.05	11.40	5.70				
411	- 415	55.30	26.15	23.30	17.65	11.95	6.25	.55			
415	- 419	55.85	26.75	23.90	18.20	12.50	6.80	1.15			
419	- 423	56.40	27.30	24.45	18.75	13.05	7.40	1.70			
423	- 427	57.00	27.85	25.00	19.30	13.60	7.95	2.25			
427	- 431	57.55	28.40	25.55	19.85	14.20	8.50	2.80			
431	- 435	58.10	28.95	26.10	20.45	14.75	9.05	3.35			
435	- 439	58.65	29.50	26.70	21.00	15.30	9.60	3.95			
439	- 443	59.20	30.10	27.25	21.55	15.85	10.20	4.50			
443	- 447	59.80	30.65	27.80	22.10	16.40	10.75	5.05			
447	- 451	60.35	31.20	28.35	22.65	17.00	11.30	5.60			
451	- 455	60.90	31.75	28.90	23.25	17.55	11.85	6.15	.50		
455	- 459	61.45	32.30	29.50	23.80	18.10	12.40	6.75	1.05		
459	- 463	62.00	32.90	30.05	24.35	18.65	12.95	7.30	1.60		
463	- 467	62.60	33.45	30.60	24.90	19.20	13.55	7.85	2.15		
467	- 471	63.15	34.00	31.15	25.45	19.80	14.10	8.40	2.70		
471	- 475	63.70	34.55	31.70	26.05	20.35	14.65	8.95	3.30		
475	- 479	64.25	35.10	32.30	26.60	20.90	15.20	9.55	3.85		
479	- 483	64.80	35.70	32.85	27.15	21.45	15.75	10.10	4.40		
483	- 487	65.40	36.25	33.40	27.70	22.00	16.35	10.65	4.95		
487	- 491	65.95	36.80	33.95	28.25	22.60	16.90	11.20	5.50		
491	- 495	66.50	37.35	34.50	28.85	23.15	17.45	11.75	6.10	.40	
495	- 499	67.05	37.90	35.10	29.40	23.70	18.00	12.35	6.65	.95	
499	- 503	67.60	38.50	35.65	29.95	24.25	18.55	12.90	7.20	1.50	
503	- 507	68.20	39.05	36.20	30.50	24.80	19.15	13.45	7.75	2.05	
507	- 511	68.75	39.60	36.75	31.05	25.40	19.70	14.00	8.30	2.65	
511	- 515	69.30	40.15	37.30	31.65	25.95	20.25	14.55	8.90	3.20	
515	- 519	69.85	40.70	37.90	32.20	26.50	20.80	15.15	9.45	3.75	
519	- 523	70.40	41.30	38.45	32.75	27.05	21.35	15.70	10.00	4.30	
523	- 527	71.00	41.85	39.00	33.30	27.60	21.95	16.25	10.55	4.85	
527	- 531	71.55	42.40	39.55	33.85	28.20	22.50	16.80	11.10	5.45	
531	- 535	72.10	42.95	40.10	34.45	28.75	23.05	17.35	11.70	6.00	.30
535	- 539	72.65	43.50	40.70	35.00	29.30	23.60	17.90	12.25	6.55	.85
539	- 543	73.20	44.10	41.25	35.55	29.85	24.15	18.50	12.80	7.10	1.40
543	- 547	73.80	44.65	41.80	36.10	30.40	24.75	19.05	13.35	7.65	2.00
547	- 551	74.35	45.20	42.35	36.65	31.00	25.30	19.60	13.90	8.25	2.55
551	- 555	74.90	45.75	42.90	37.25	31.55	25.85	20.15	14.50	8.80	3.10

This table is available on TOD

D-2

Vous pouvez obtenir cette table sur TSD

British Columbia provincial tax deductions

Effective January 1, 2009

Weekly (52 pay periods a year)

**Also look up the tax deductions
in the federal table**
Retenues d'impôt provincial de la Colombie-Britannique

 En vigueur le 1^{er} janvier 2009

Hebdomadaire (52 périodes de paie par année)

**Cherchez aussi les retenues d'impôt
dans la table fédérale**

Pay Rémunération		Provincial claim codes/Codes de demande provinciaux										
		0	1	2	3	4	5	6	7	8	9	10
From De	Less than Moins de	Deduct from each pay Retenez sur chaque paie										
343		*	.00							*You normally use claim code "0" only for non-resident employees. However, if you have non-resident employees who earn less than the minimum amount shown in the "Pay" column, you may not be able to use these tables. Instead, refer to the "Step-by-step calculation of tax deductions" in Section "A" of this publication.		
343 - 345	9.30	.20										
345 - 347	9.45	.35										
347 - 349	9.60	.50										
349 - 351	9.80	.65										
351 - 353	9.95	.80								*Le code de demande «0» est normalement utilisé seulement pour les non-résidents. Cependant, si la rémunération de votre employé non résidant est inférieure au montant minimum indiqué dans la colonne «Rémunération», vous ne pourrez peut-être pas utiliser ces tables. Reportez-vous alors au «Calcul des retenues d'impôt, étape par étape» dans la section «A» de cette publication.		
353 - 355	10.10	.95										
355 - 357	10.25	1.15	.10									
357 - 359	10.40	1.30	.25									
359 - 361	10.55	1.45	.40									
361 - 363	10.75	1.60	.60									
363 - 365	10.90	1.75	.75									
365 - 367	11.05	1.90	.90									
367 - 369	11.20	2.10	1.05									
369 - 371	11.35	2.25	1.20									
371 - 373	11.50	2.40	1.35									
373 - 375	11.70	2.55	1.55									
375 - 377	11.85	2.70	1.70									
377 - 379	12.00	2.90	1.85									
379 - 381	12.15	3.05	2.00									
381 - 383	12.30	3.20	2.15	.10								
383 - 385	12.45	3.35	2.30	.25								
385 - 387	12.65	3.50	2.50	.45								
387 - 389	12.80	3.65	2.65	.60								
389 - 391	12.95	3.85	2.80	.75								
391 - 393	13.10	4.00	2.95	.90								
393 - 395	13.25	4.15	3.10	1.05								
395 - 397	13.40	4.30	3.30	1.20								
397 - 399	13.60	4.45	3.45	1.40								
399 - 401	13.75	4.60	3.60	1.55								
401 - 403	13.90	4.80	3.75	1.70								
403 - 405	14.05	4.95	3.90	1.85								
405 - 407	14.20	5.10	4.05	2.00								
407 - 409	14.35	5.25	4.25	2.15	.10							
409 - 411	14.55	5.40	4.40	2.35	.30							
411 - 413	14.70	5.55	4.55	2.50	.45							
413 - 415	14.85	5.75	4.70	2.65	.60							
415 - 417	15.00	5.90	4.85	2.80	.75							
417 - 419	15.15	6.05	5.00	2.95	.90							
419 - 421	15.30	6.20	5.20	3.10	1.05							
421 - 423	15.50	6.35	5.35	3.30	1.25							
423 - 425	15.65	6.50	5.50	3.45	1.40							
425 - 427	15.80	6.70	5.65	3.60	1.55							
427 - 429	15.95	6.85	5.80	3.75	1.70							
429 - 431	16.10	7.00	5.95	3.90	1.85							
431 - 433	16.25	7.15	6.15	4.10	2.00							
433 - 435	16.45	7.30	6.30	4.25	2.20	.15						
435 - 437	16.60	7.45	6.45	4.40	2.35	.30						
437 - 439	16.75	7.65	6.60	4.55	2.50	.45						
439 - 441	16.90	7.80	6.75	4.70	2.65	.60						
441 - 443	17.05	7.95	6.90	4.85	2.80	.75						
443 - 445	17.20	8.10	7.10	5.05	2.95	.90						
445 - 447	17.40	8.25	7.25	5.20	3.15	1.10						
447 - 449	17.55	8.40	7.40	5.35	3.30	1.25						
449 - 451	17.70	8.60	7.55	5.50	3.45	1.40						

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E-1

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