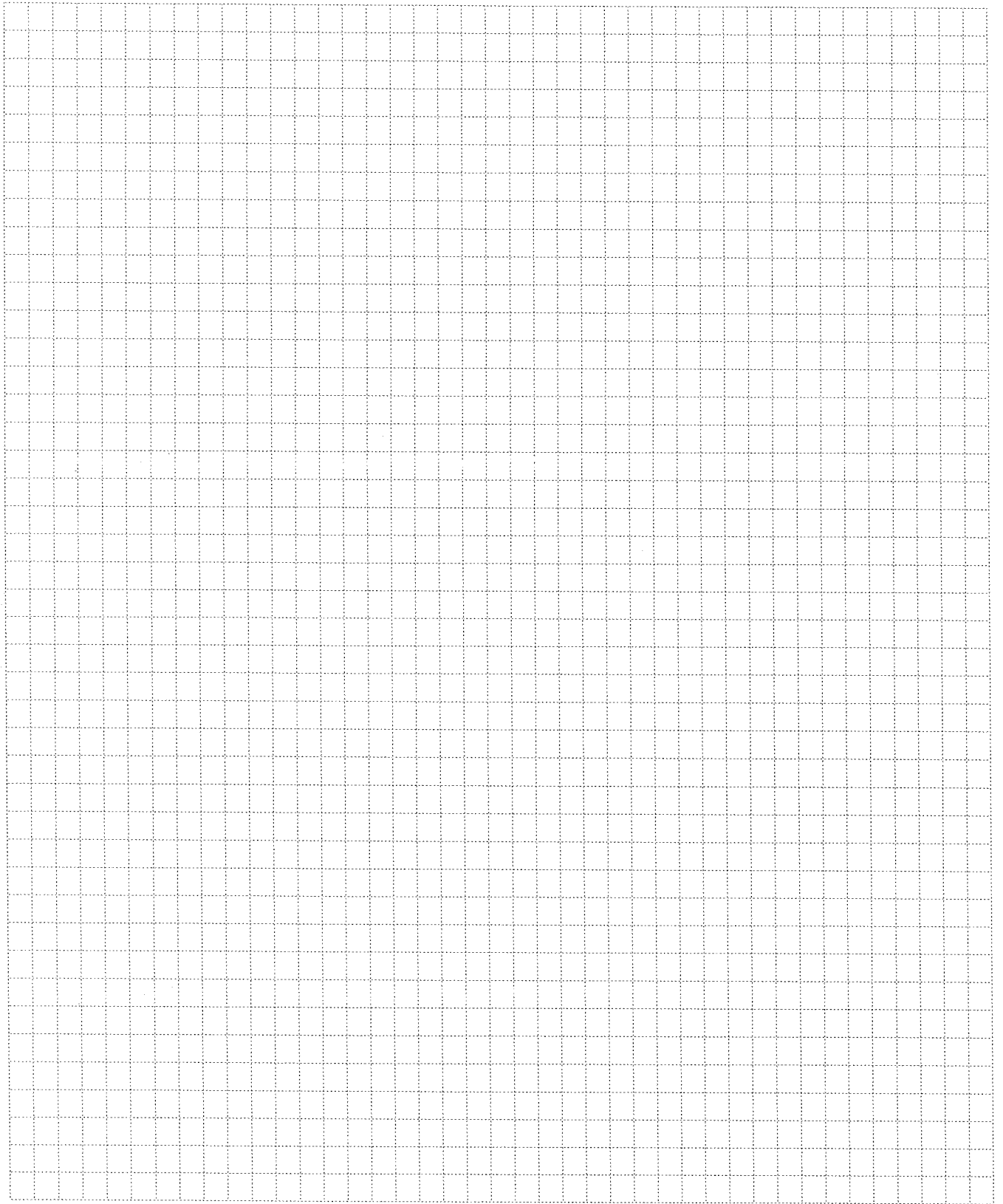


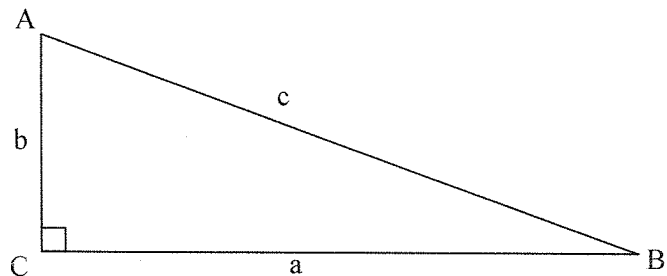
MBF3C Unit 1 - Trigonometry

Section	Date	Lesson Title	Handouts	Homework Assigned
1		Review of Pythagorean Theorem Labelling Triangles Primary Trigonometric Ratios		Supplemental Worksheet (not provided)
2		Review Trigonometry - Solving for Sides	U01A01	Supplemental Worksheet (not provided)
3		Review Trigonometry - Solving for Angles	U01A02	Supplemental Worksheet (not provided)
4		Trigonometry in the Real World	U01A03-P1 U01A03-P2	U01A04-P1 U01A04-P2 U01A04-P3
5		Sine Law	U01A05-P1 U01A05-P2	U01A06
6		Cosine Law		U01A07
7		Making Decisions	U01A08	U01A09
8		Real World Problems		U01A10
9		More Real World Problems		U01A11
10		Review Day/Practice Test	U01A14	U01A15
11		Flex Period		
12		Test Day		



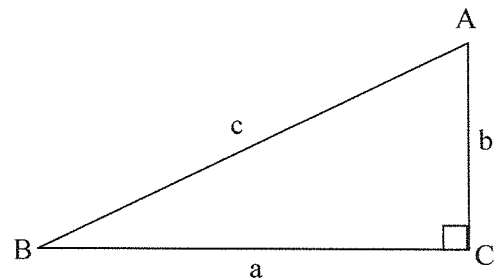
Solving for Side Lengths in Right Triangles

1. Based on the following diagram (not drawn to scale) use the values given to find the missing/indicated side:



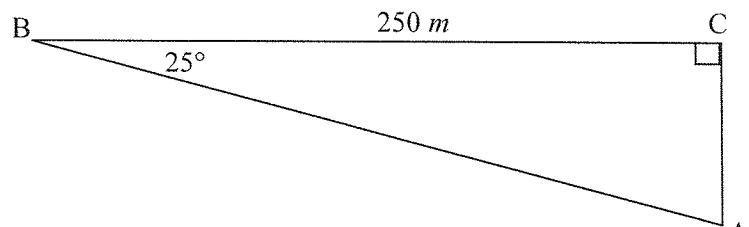
- (a) $\angle A = 55^\circ, c = 25\text{ m} \rightarrow$ find a
 (b) $\angle A = 65^\circ, c = 32\text{ cm} \rightarrow$ find b
 (c) $\angle B = 15^\circ, c = 42\text{ m} \rightarrow$ find b
 (d) $\angle B = 35^\circ, c = 55\text{ cm} \rightarrow$ find a

2. Based on the following diagram (not drawn to scale) use the values given to find the missing/indicated side:

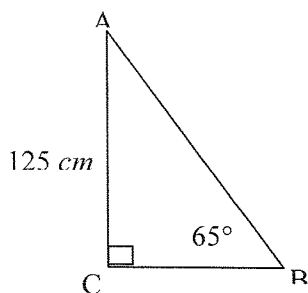


- (a) $\angle A = 75^\circ, b = 52\text{ m} \rightarrow$ find a
 (b) $\angle A = 64^\circ, a = 23\text{ cm} \rightarrow$ find b
 (c) $\angle B = 18^\circ, a = 24\text{ m} \rightarrow$ find b
 (d) $\angle B = 31^\circ, b = 58\text{ cm} \rightarrow$ find a

3. Given the following diagram (not drawn to scale) solve for the lengths of the missing sides. (ie: BA and CA)

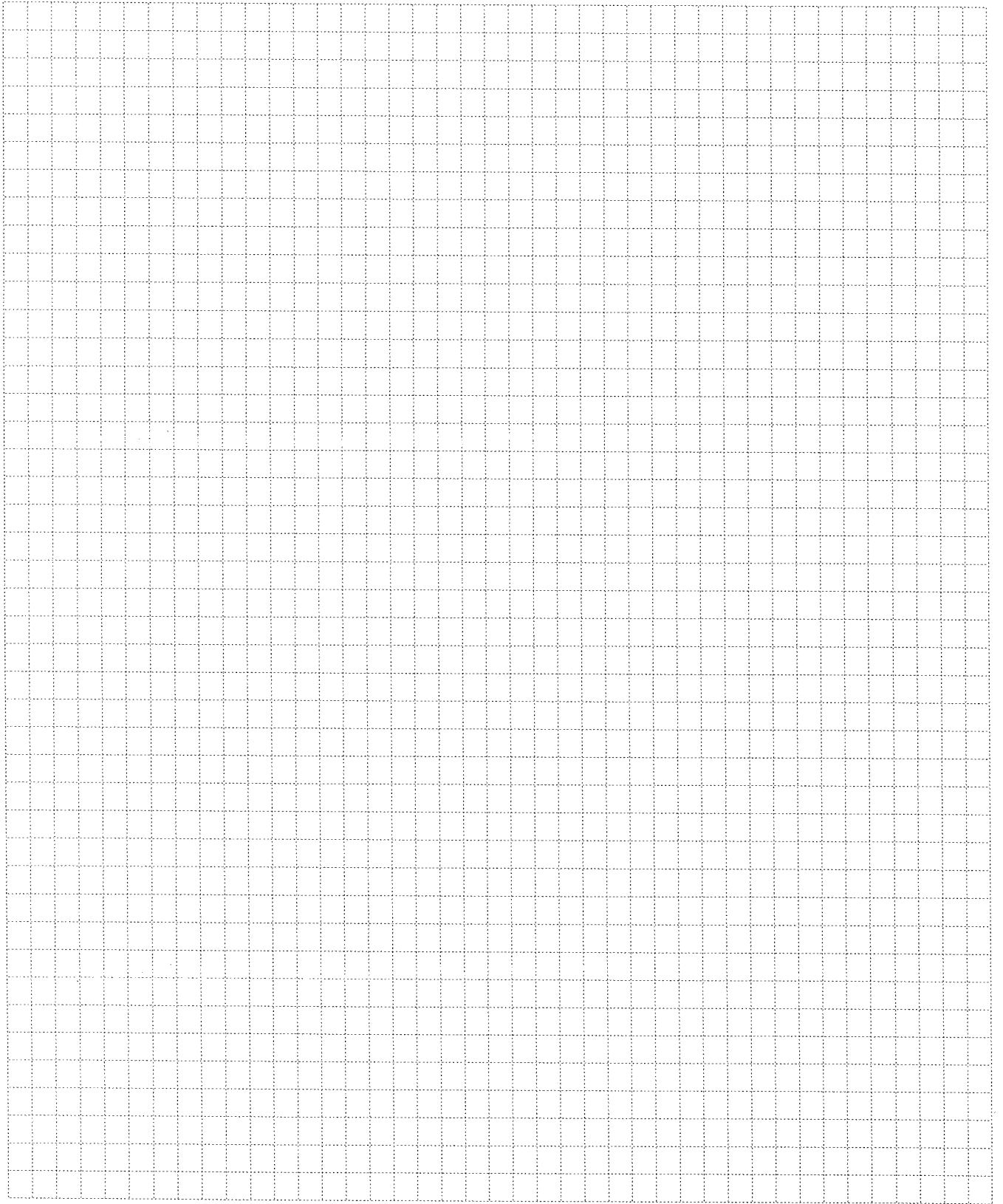


4. Given the following diagram (not drawn to scale) solve for the lengths of the missing sides. (ie: AB and CB)



Solutions: (Note: answers should be within a decimal place depending on accuracy of numbers used.)

1. (a) $a = 20.5\text{ m}$ (b) $b = 13.5\text{ cm}$ (c) $b = 10.9\text{ m}$ (d) $a = 45.1\text{ cm}$
 2. (a) $a = 194.1\text{ m}$ (b) $b = 11.2\text{ cm}$ (c) $b = 7.8\text{ m}$ (d) $a = 96.5\text{ cm}$
 3. $b = 116.6\text{ m}$ $c = 275.8\text{ m}$
 4. $a = 58.3\text{ cm}$ $c = 137.9\text{ cm}$



Solving for Angles in Right Triangles

Diagrams are not drawn to scale. Round angle measures to the nearest degree. The side length answers should be rounded to one decimal place.

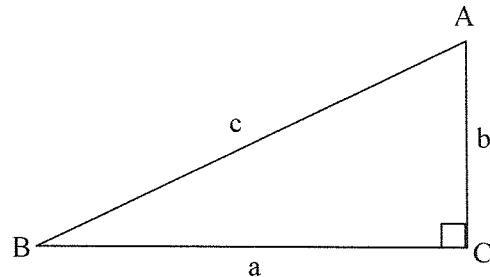
1. Based on the following diagram, use the values given to find the missing/indicated side:

(a) $a = 58 \text{ cm}, c = 124 \text{ cm} \rightarrow$ find $\angle A$

(b) $b = 75 \text{ m}, c = 215 \text{ m} \rightarrow$ find $\angle A$

(c) $b = 64 \text{ m}, c = 225 \text{ m} \rightarrow$ find $\angle B$

(d) $a = 45 \text{ cm}, c = 238 \text{ cm} \rightarrow$ find $\angle B$



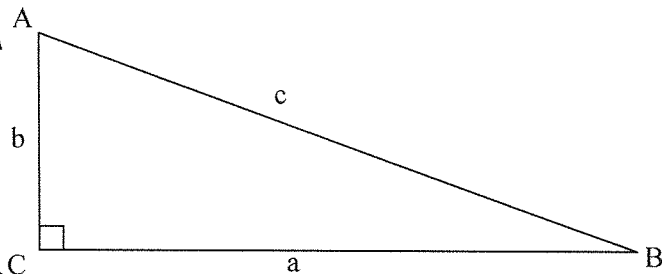
2. Based on the following diagram, use the values given to find the missing/indicated side:

(a) $a = 55 \text{ cm}, b = 137 \text{ cm} \rightarrow$ find $\angle A$

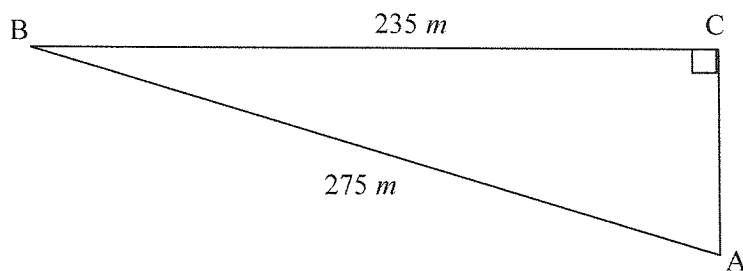
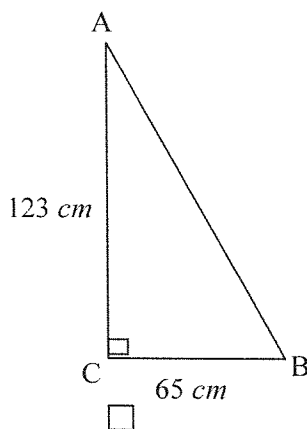
(b) $a = 235 \text{ m}, b = 68 \text{ m} \rightarrow$ find $\angle A$

(c) $a = 212 \text{ m}, b = 100 \text{ m} \rightarrow$ find $\angle B$

(d) $a = 30 \text{ cm}, b = 285 \text{ cm} \rightarrow$ find $\angle B$



3. Using the diagram below on the left solve for the measure of the missing angles.



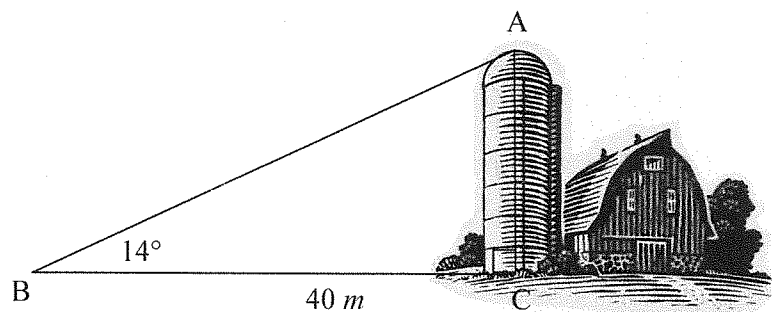
4. Using the diagram above on the right solve for both the measure of the missing angles and the length of the missing side.

Solutions:

1. (a) $\angle A = 28^\circ$ (b) $\angle A = 70^\circ$ (c) $\angle B = 17^\circ$ (d) $\angle B = 79^\circ$
 2. (a) $\angle A = 22^\circ$ (b) $\angle A = 74^\circ$ (c) $\angle B = 25^\circ$ (d) $\angle B = 84^\circ$
 3. $\angle A = 28^\circ, \angle B = 62^\circ$ 4. $\angle A = 59^\circ, \angle B = 31^\circ, b = 142.8m$

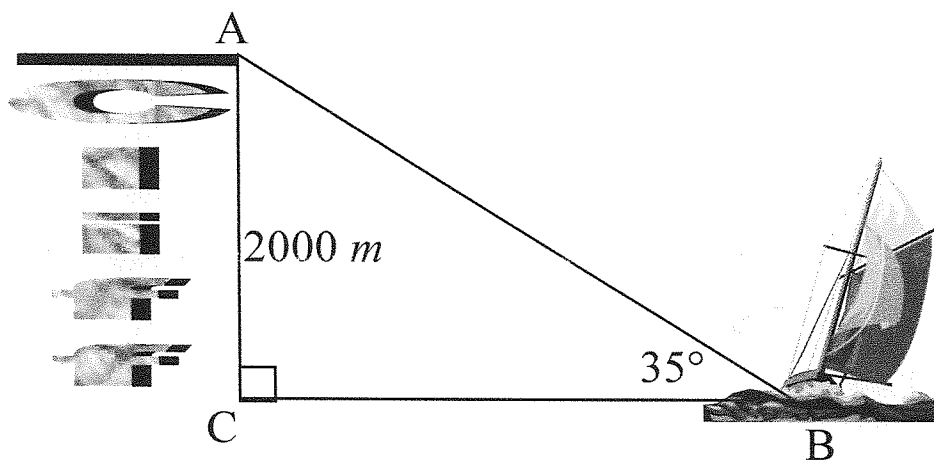
Problem 1:

While walking to school you pass a barn with a silo. Looking up to the top of the silo you estimate the angle of elevation to the top of the silo to be about 14° . You continue walking and find that you were around 40 m from the silo. Using this information and your knowledge of trigonometric ratios calculate the height of the silo.



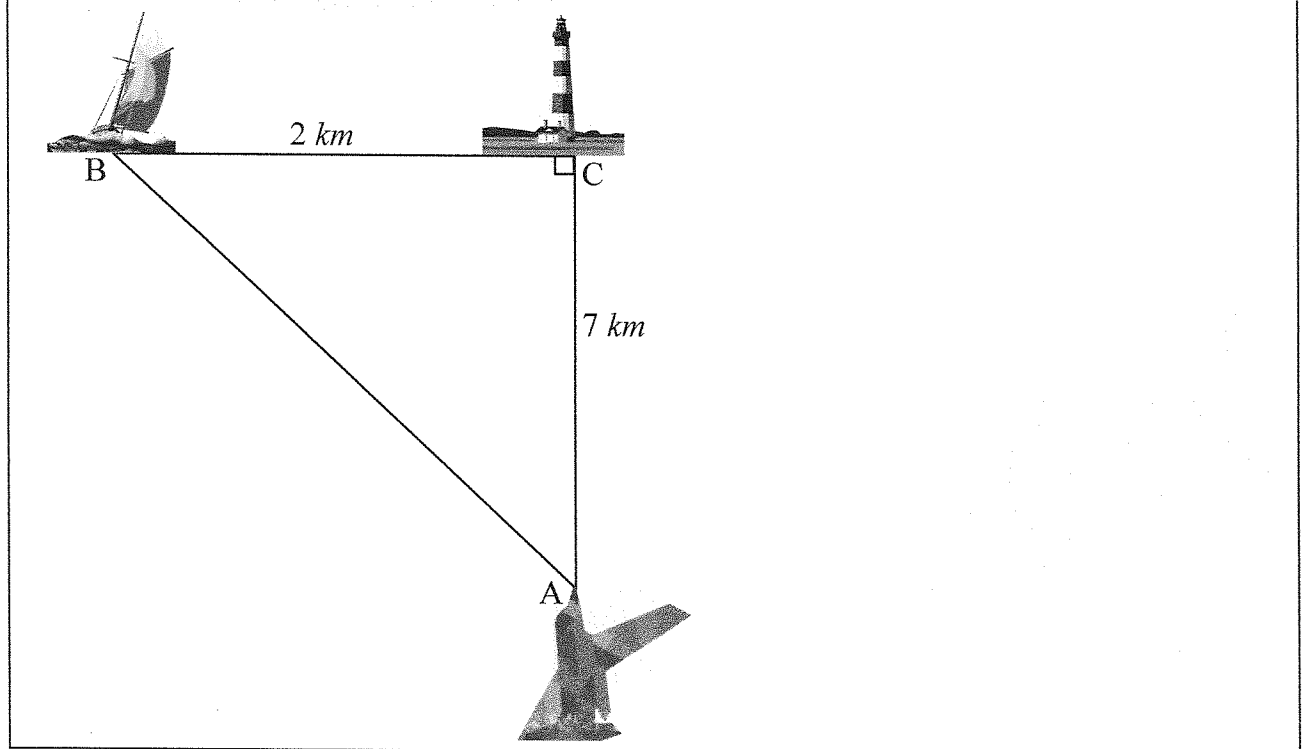
Problem 2:

A sailboat is approaching a cliff. The angle of elevation from the sailboat to the top of the cliff is 35° . The height of the cliff is known to be about 2000 m. How far is the sailboat away from the base of the cliff?



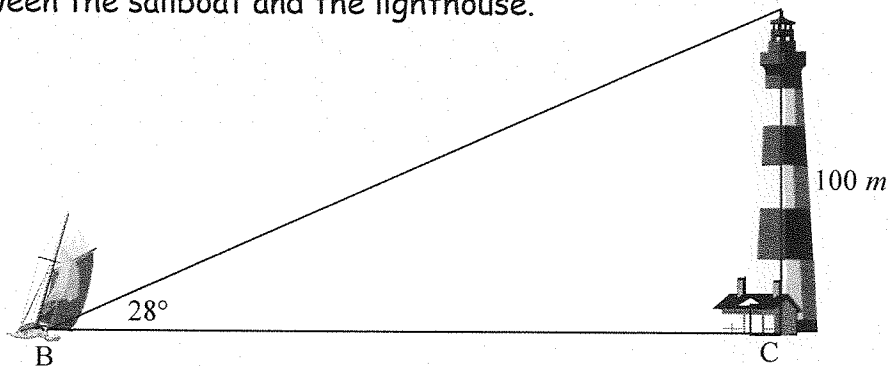
Problem 3:

A sailboat that is 2 km due west of a lighthouse sends a signal to the lighthouse that it is in distress. The lighthouse quickly signals a rescue plane that is 7 km due south of the lighthouse. What heading from due north should the plane take in order to intercept the troubled sailboat?

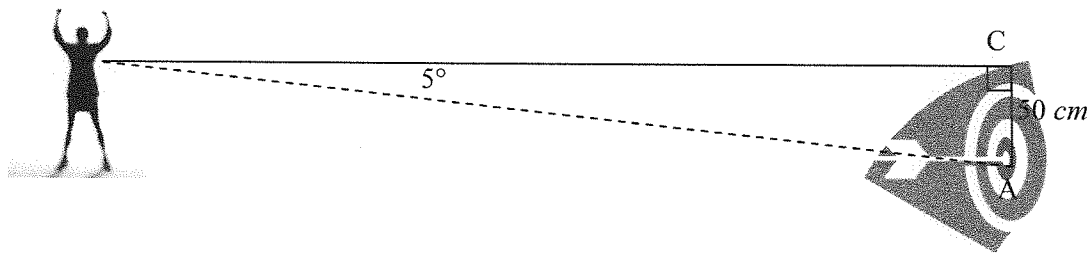


Round \angle 's to whole degrees; length answers should be rounded to 1 decimal place and include units.

1. The top of a lighthouse is 100 m above sea level. The angle of elevation from the deck of the sailboat to the top of the lighthouse is 28° . Calculate the distance between the sailboat and the lighthouse.



2. An archer shoots and gets a bulls-eye on the target. From the archer's eye level the angle of depression to the bulls-eye is 5° . The arrow is in the target 50 cm below the archer's eye level. Calculate the distance the arrow flew to hit the target (*the dotted line*).



Note: For the following questions you will need to create your own diagrams. Draw them carefully and refer to the written description to ensure you find the correct solution.

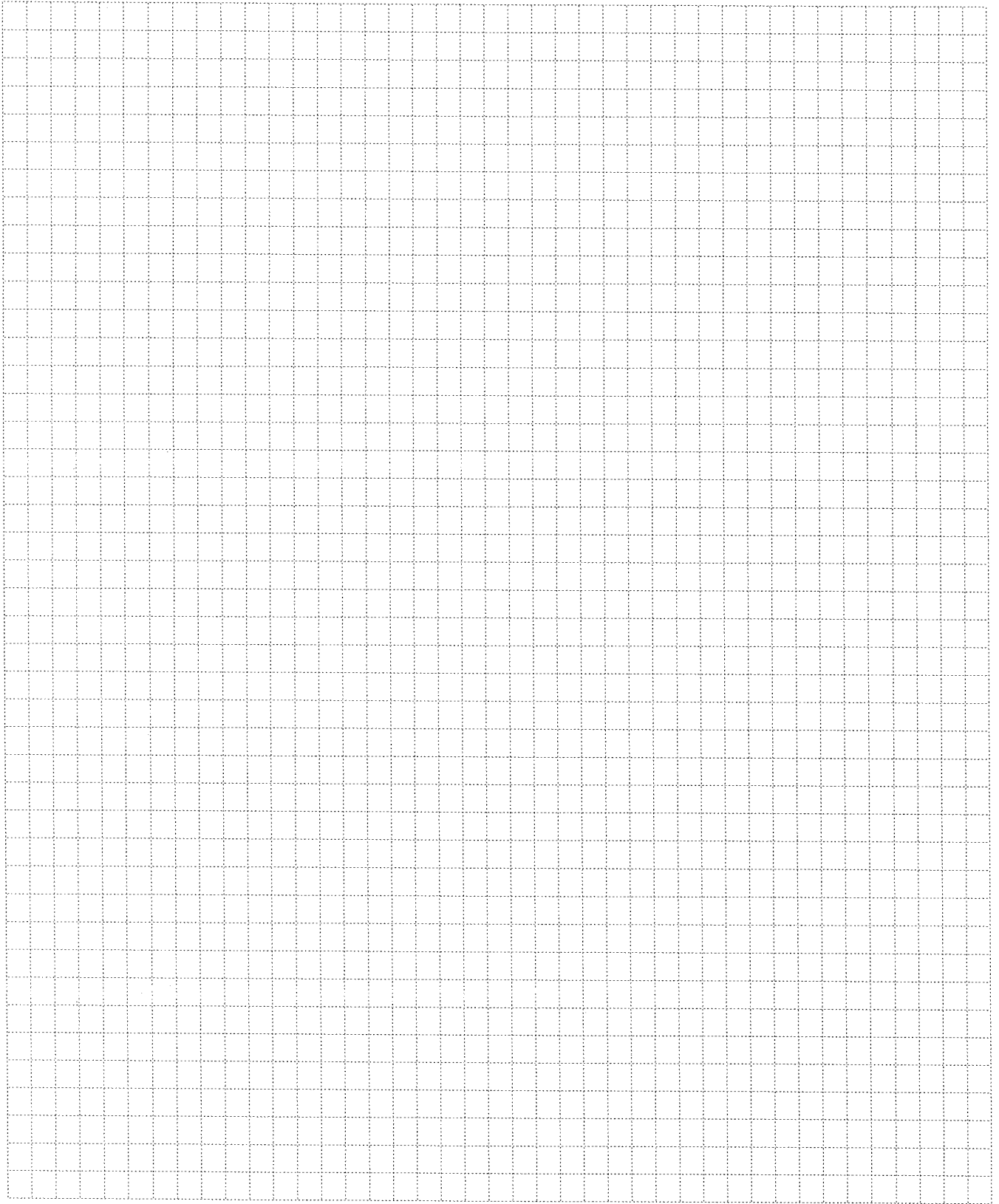
3. Two islands **A** and **B** are 3 km apart. A third island **C** is located due south of **A** and due west of **B**. From island **B** the angle between islands **A** and **C** is 33° . Calculate how far island **C** is from island **A** and from island **B**.

4. The foot (*bottom*) of a ladder is placed 1.5 m from a wall. The ladder makes a 70° angle with the level ground. Find the length of the ladder. (Round to one decimal place.)

5. A tow truck raises the front end of a car 0.75 m above the ground. If the car is 2.8 m long what angle does the car make with the ground?
6. A construction engineer determines that a straight road must rise vertically 45 m over a 250 m distance measured along the surface of the road (this represents the hypotenuse of the right triangle). Calculate the angle of elevation of the road.

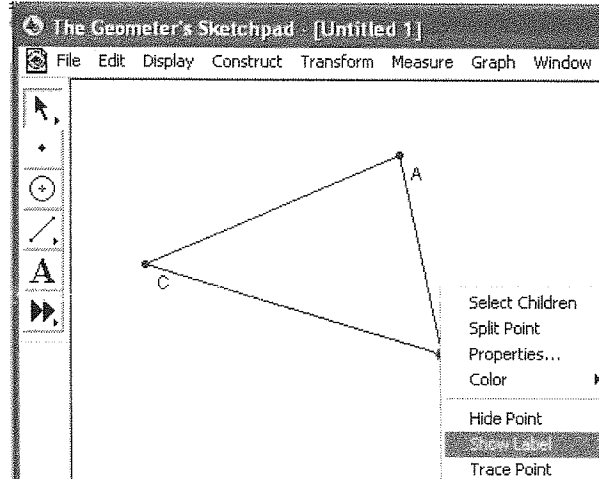
Solutions:

1. 188.1 m 2. 573.7 cm 3. Distance A to C: 1.6 km Distance B to C: 2.5 km
4. 4.4 m 5. 16° 6. 10°

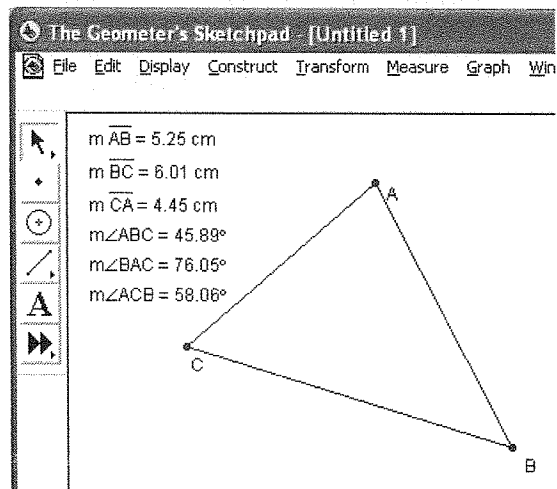


Load Geometer's Sketchpad.

1. Start with a new document (default).
2. Select the Straightedge Tool (4th button down the toolbar)
3. Draw three lines - making sure that each new line starts from a previous line and that the last point returns to the first completing the triangle. (shown right)
4. Switch to the selection tool (1st button on the toolbar)
5. Select and right-click on each vertex and from the short-cut menu select "Show Label" (also shown right)
6. Next select any line and from the Measure menu (or from the right-click short-cut) select "Length".



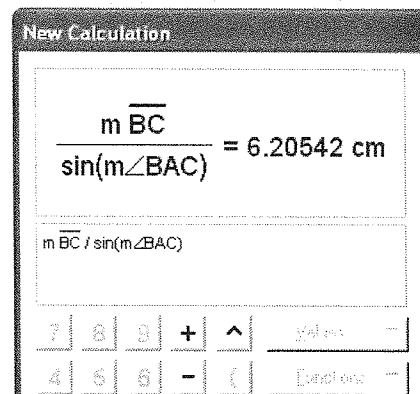
- This should display $m \overline{AB}$ (shown)
7. Repeat Step 6 for the other lines, making sure to unselect before selecting a new line. (If anything else is selected length may not appear on the menu.)
 8. Next select in the following order the vertices: A, B then C - then click the Measure menu and choose "Angle".



This should display $m \angle ABC$ and the measure of that angle.

9. Now repeat Step 8 but for angles $\angle BAC$ and $\angle ACB$. (shown)
10. If you select any point you can drag the point to a new location and all of the measurements update automatically. (You can also select and move an entire line.)
11. Try this and adjust the position of the triangle to leave more room below our measurements.
12. We will now add some calculations namely the values for the Sine Law:

$$\frac{a}{\sin \angle A} = \frac{b}{\sin \angle B} = \frac{c}{\sin \angle C}$$
13. To do this select the Measure menu and select "Calculate...". A new dialogue box appears
14. shown right) where we will enter our calculation.

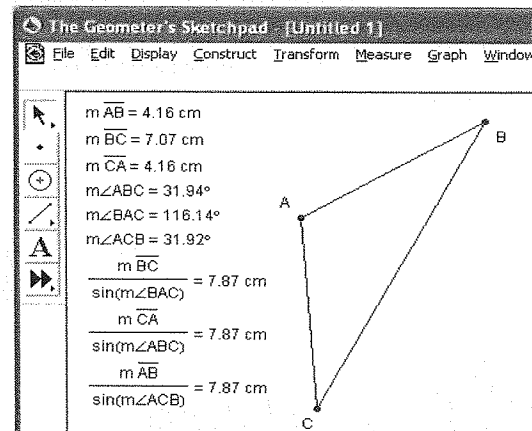
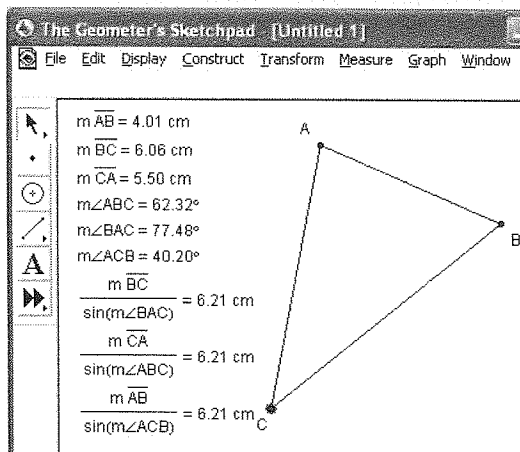


Investigation: The Sine Law (using Geometer's Sketchpad)

- First click on the measurement for side a (in this case it is $m\overline{BC}$), then click on the division sign and type "si" for the sine function, next click on the measurement for $\angle A$ (in this case it is $m\angle BAC$ (depending on the size of your triangle you will see different results.) Click OK
- This will add a new measurement to your document, repeat step 15 for side b and side c . For side b use $m\overline{CA}$ and $\sin(m\angle ABC)$ for side c use $m\overline{AB}$ and $\sin(m\angle ACB)$. Calculations are shown in the bottom diagrams.
- Now change the position of your vertices; this will change the lengths and angles in your triangle - make note of all three of the calculation boxes for the Sine Law.

$$\frac{a}{\sin \angle A} = \frac{b}{\sin \angle B} = \frac{c}{\sin \angle C}$$

(two variations shown below)

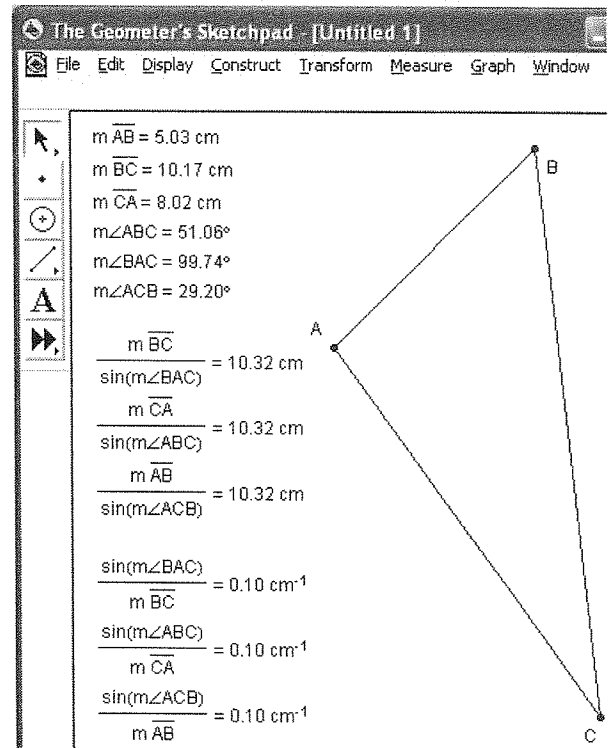


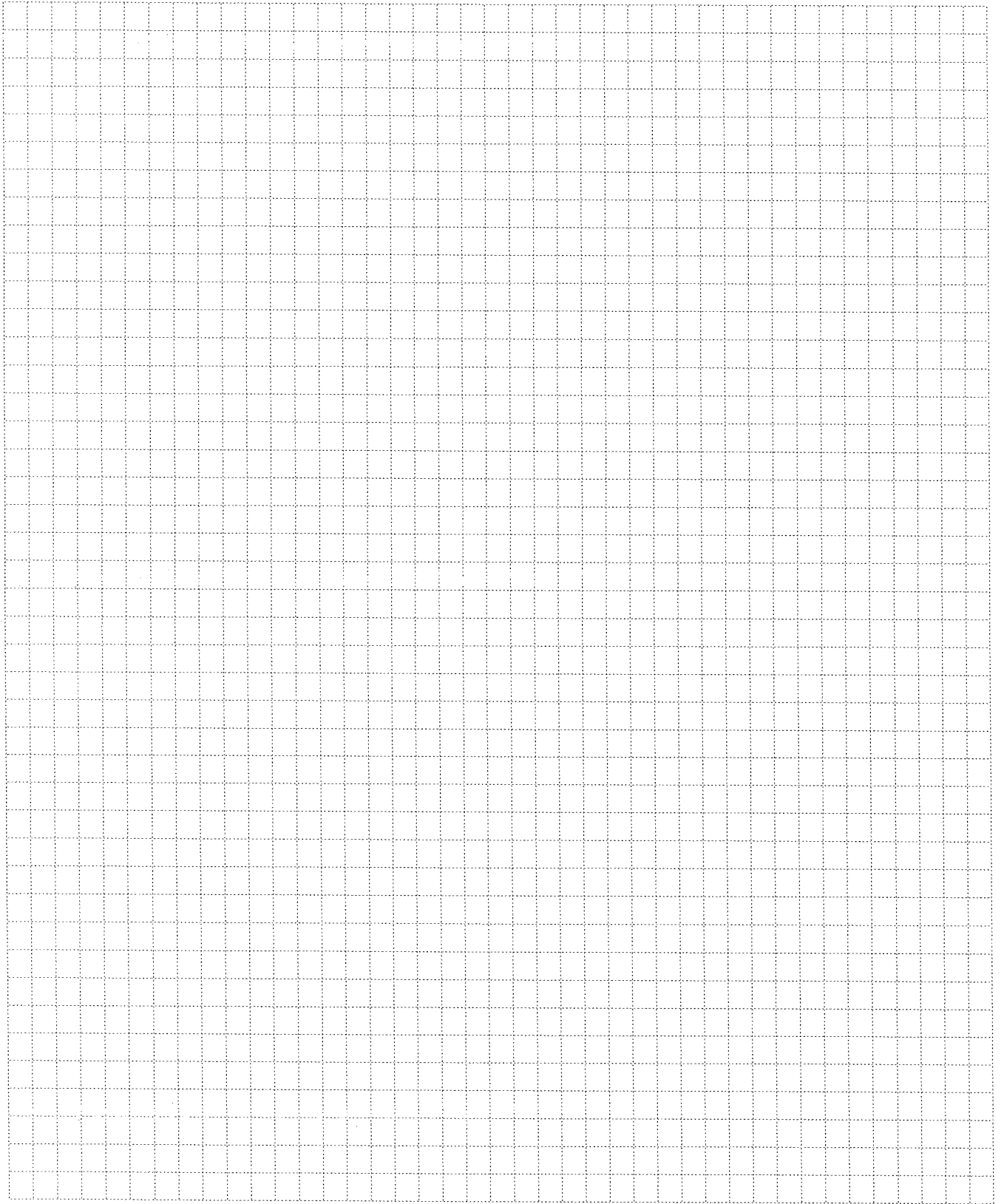
- Next create three more calculations for the other version of the Sine Law:

$$\frac{\sin \angle A}{a} = \frac{\sin \angle B}{b} = \frac{\sin \angle C}{c} \quad (\text{shown right})$$

- Experiment with more positions of the triangle vertices.
- Notice that the set of three values in either version of the Sine Law remain the same. This shows that the ratio of any side to the sine of the corresponding angle in a triangle remains equal to the ratio of any other side to the sine of the corresponding angle. Either

$$\frac{\sin \angle A}{a} = \frac{\sin \angle B}{b} = \frac{\sin \angle C}{c}$$



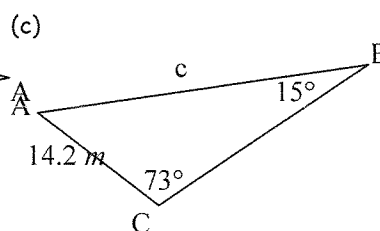
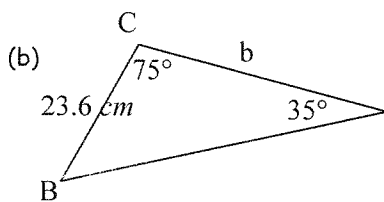
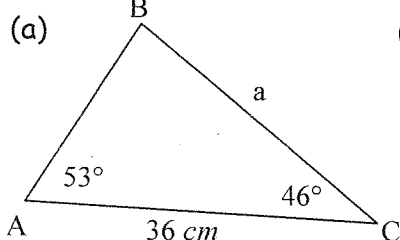


The Sine Law Homework

1. Solve for the given variable (correct to 1 decimal place) in each of the following:

(a) $\frac{a}{\sin 35^\circ} = \frac{10}{\sin 40^\circ}$ (b) $\frac{65}{\sin 75^\circ} = \frac{b}{\sin 48^\circ}$ (c) $\frac{75}{\sin 55^\circ} = \frac{c}{\sin 80^\circ}$

2. For each of the following diagrams write the equation you would use to solve for the indicated variable:



3. Solve for each of the required variables from Question #2.

4. For each of the following triangle descriptions you should make a sketch and then find the indicated side rounded correctly to one decimal place.

(a) In $\triangle ABC$, given that $\angle A = 57^\circ$, $\angle B = 73^\circ$, and $AB = 24$ cm. Find the length of AC

(b) In $\triangle ABC$, given that $\angle B = 38^\circ$, $\angle C = 56^\circ$, and $BC = 63$ cm. Find the length of AB

(c) In $\triangle ABC$, given that $\angle A = 50^\circ$, $\angle B = 50^\circ$, and $AC = 27$ m. Find the length of AB

(d) In $\triangle ABC$, given that $\angle A = 23^\circ$, $\angle C = 78^\circ$, and $AB = 15$ cm. Find the length of BC

(e) In $\triangle ABC$, given that $\angle A = 55^\circ$, $\angle B = 32^\circ$, and $BC = 77$ cm. Find the length of AC

(f) In $\triangle ABC$, given that $\angle B = 14^\circ$, $\angle C = 78^\circ$, and $AC = 36$ m. Find the length of BC

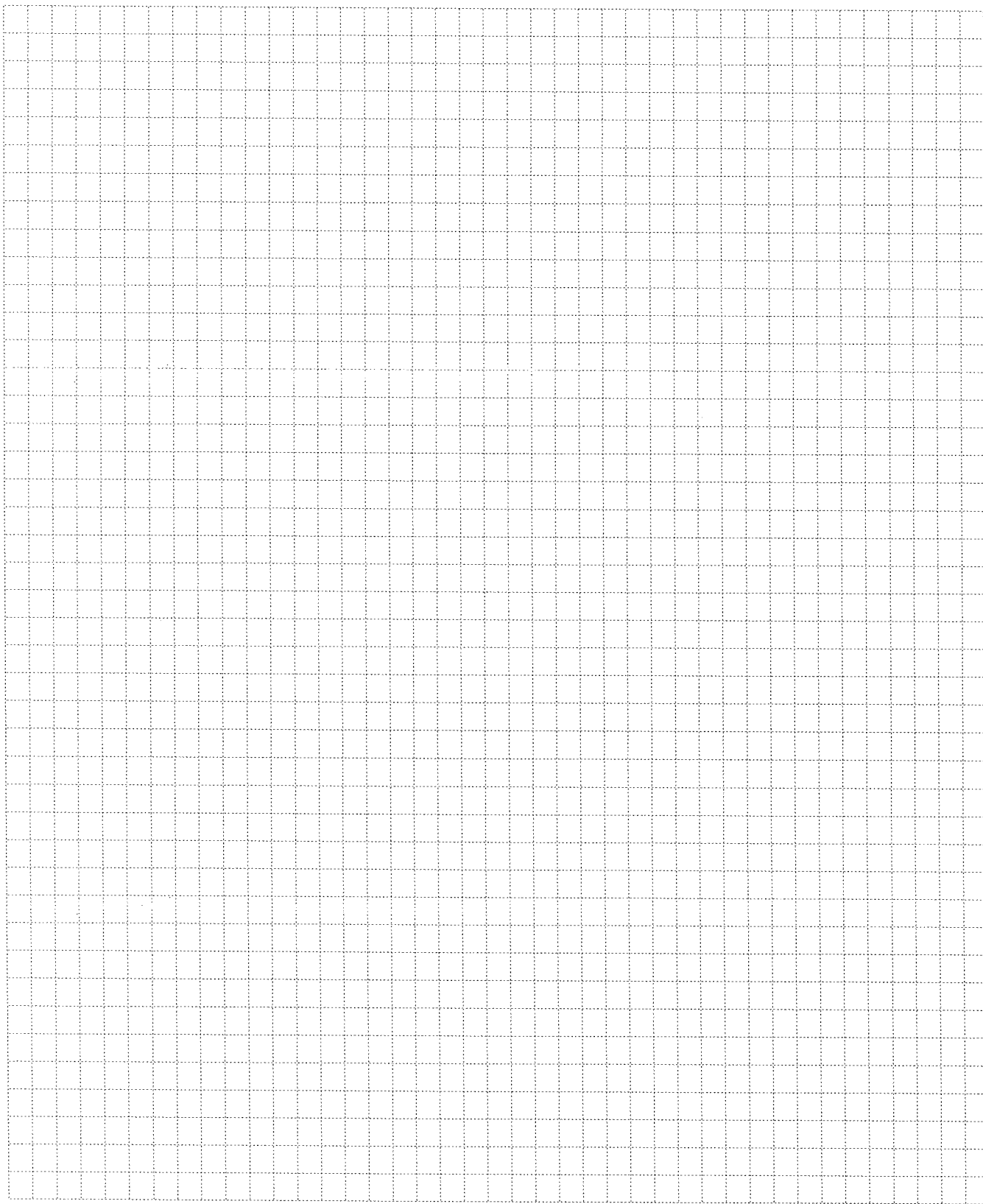
Solutions:

1. (a) 8.9 units (b) 50.0 units (c) 90.2 units

2. (a) $\frac{a}{\sin 53^\circ} = \frac{36}{\sin 81^\circ}$ (b) $\frac{23.6}{\sin 35^\circ} = \frac{b}{\sin 70^\circ}$ (c) $\frac{14.2}{\sin 15^\circ} = \frac{c}{\sin 73^\circ}$

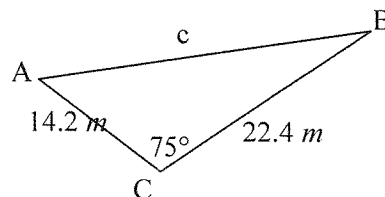
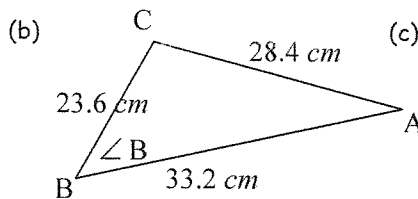
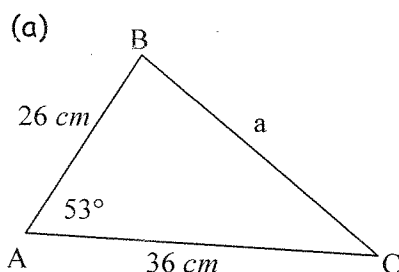
3. (a) 29.1 cm (b) 38.7 cm (c) 52.5 m

4. (a) 30.0 cm (b) 52.4 cm (c) 34.7 m (d) 6.0 cm (e) 49.8 cm (f) 148.7 m



The Cosine Law Homework

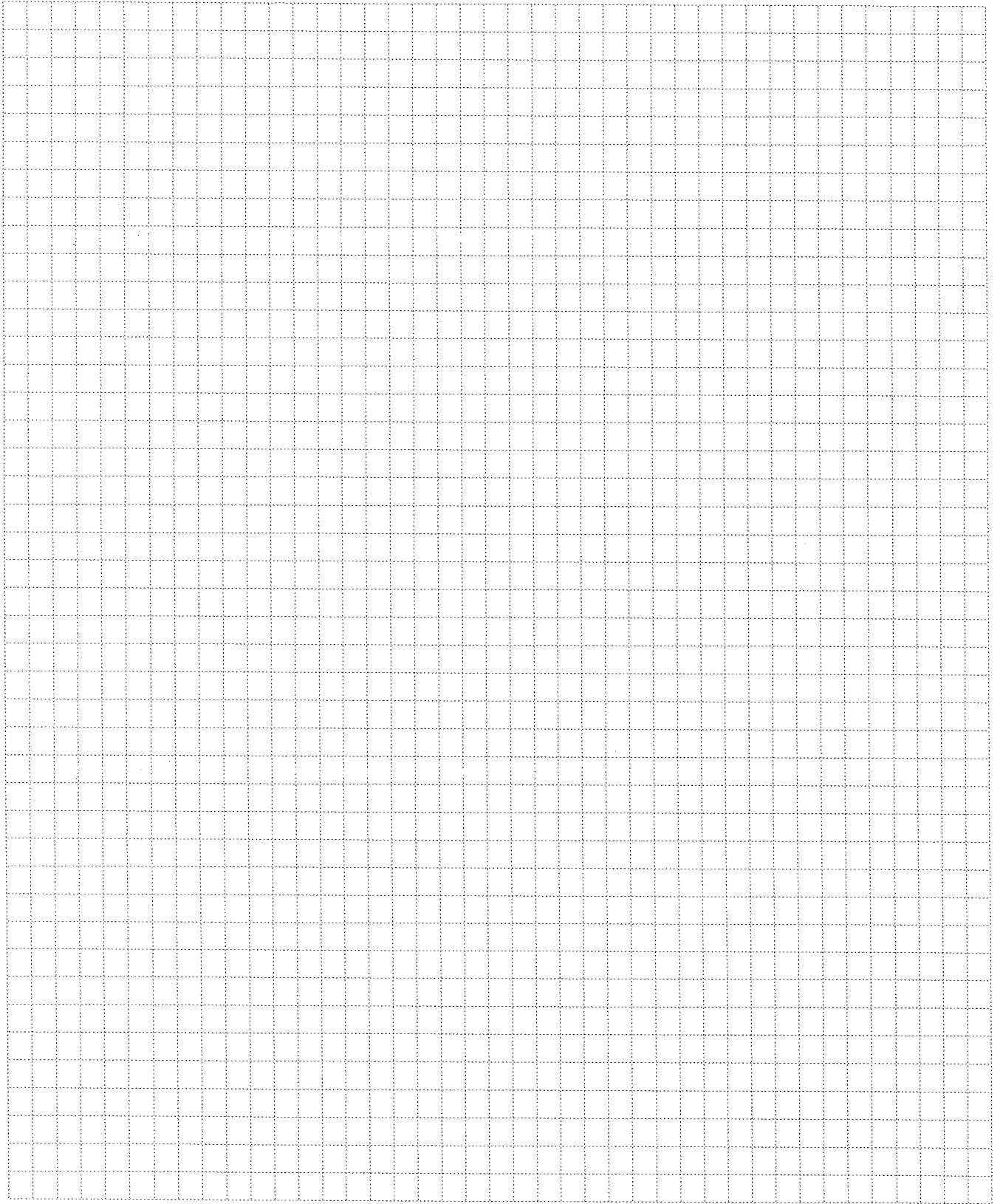
1. For each of the following diagrams write the equation you would use to solve for the indicated variable:



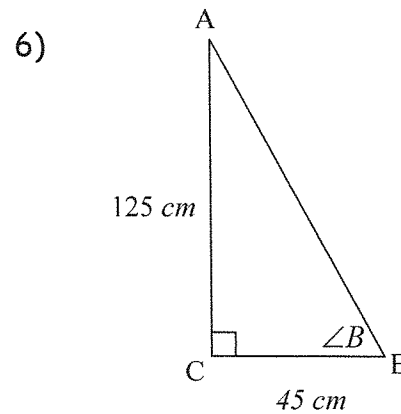
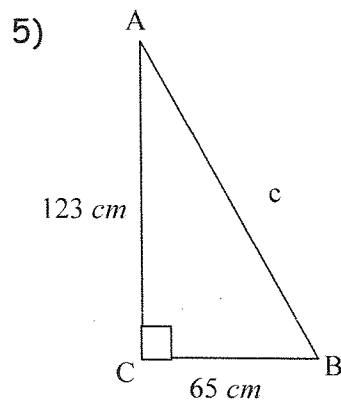
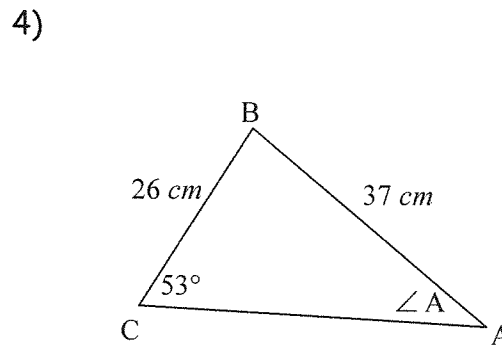
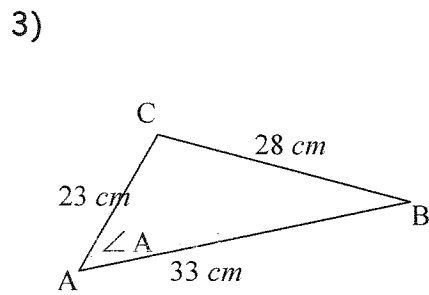
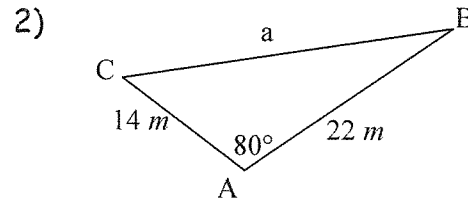
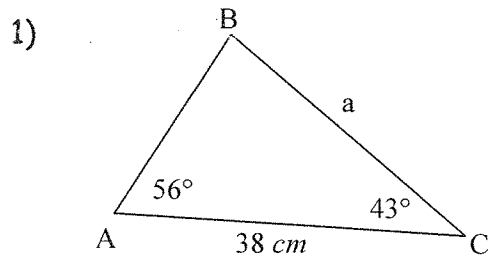
2. Solve for each of the required variables from Question #1.
3. For each of the following triangle descriptions you should make a sketch and then find the indicated value.
- In $\triangle ABC$, given that $AB = 24$ cm, $AC = 34$ cm, and $\angle A = 67^\circ$. Find the length of BC
 - In $\triangle ABC$, given that $AB = 15$ m, $BC = 8$ m, and $\angle B = 24^\circ$. Find the length of AC
 - In $\triangle ABC$, given that $AC = 10$ cm, $BC = 9$ cm, and $\angle C = 48^\circ$. Find the length of AB
 - In $\triangle ABC$, given that $\angle A = 24^\circ$, $AB = 18.6$ m, and $AC = 13.2$ m. Find the length of BC
 - In $\triangle ABC$, given that $AB = 9$ m, $AC = 12$ m, and $BC = 15$ m. Find the measure of $\angle B$.
 - In $\triangle ABC$, given that $AB = 18.4$ m, $BC = 9.6$ m, and $AC = 10.8$ m. Find the measure of $\angle A$.

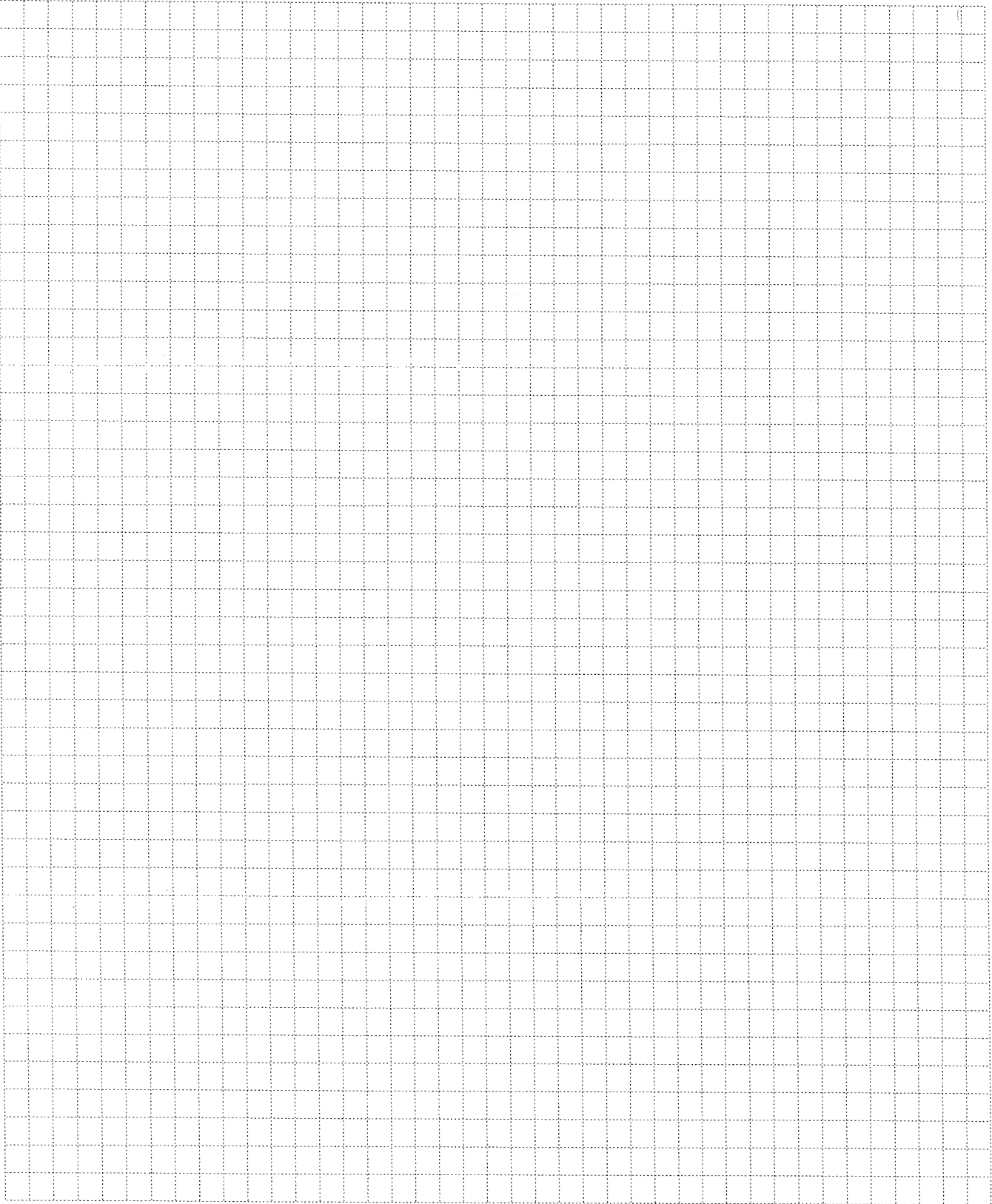
Solutions:

- $a^2 = (36)^2 + (26)^2 - 2(36)(26) \cdot \cos 53^\circ$
 - $(28.4)^2 = (23.6)^2 + (33.2)^2 - 2(23.6)(33.2) \cdot \cos \angle B$
 - $c^2 = (22.4)^2 + (14.2)^2 - 2(22.4)(14.2) \cdot \cos 75^\circ$
- (a) 29.1 cm (b) 57° (c) 23.2 m
- (a) 33.1 cm (b) 8.4 m (c) 7.8 cm (d) 8.5 m (e) 53° (f) 24°



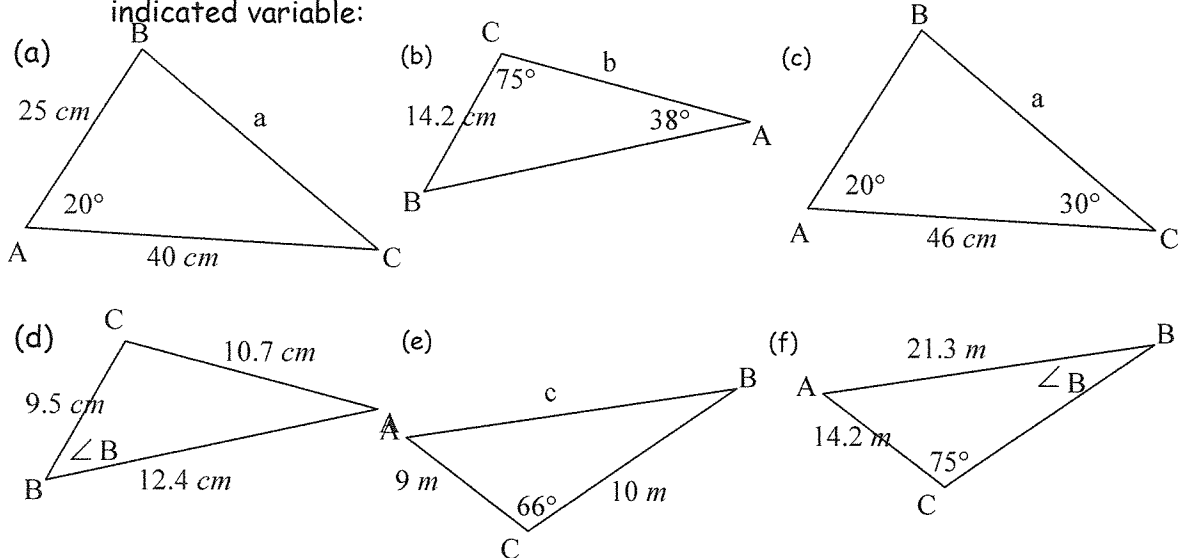
Making Decisions in Trigonometry





Round \angle 's to whole degrees; length answers should be rounded to 1 decimal place and include units.

1. For each of the following diagrams write the equation you would use to solve for the indicated variable:



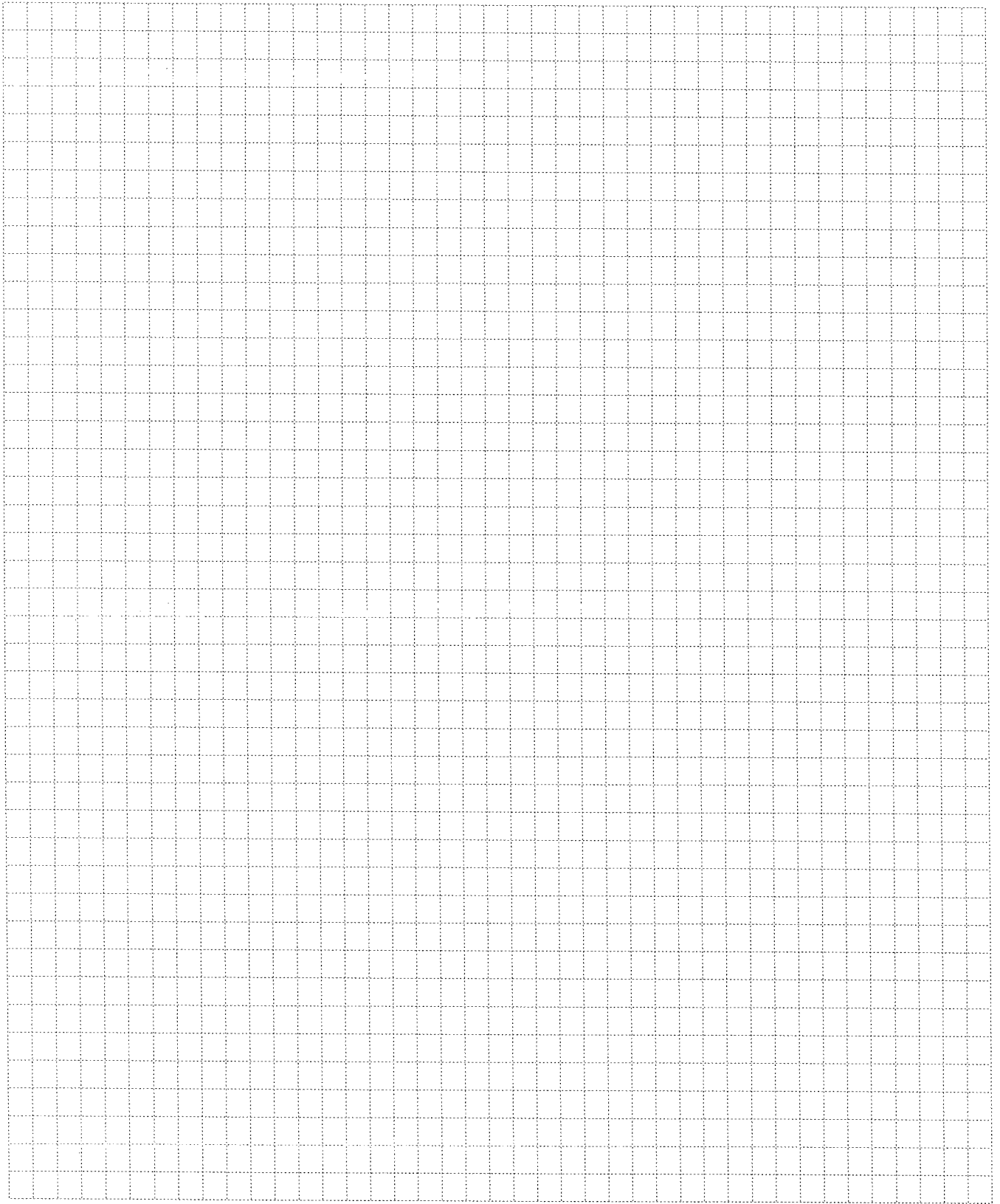
2. Solve for each of the required variables from Question #1.

3. For each of the following triangle descriptions you should make a sketch and then completely solve each triangle.

- (a) In $\triangle ABC$, given that $\angle A = 38^\circ$, $\angle C = 85^\circ$, and $c = 32$ cm.
- (b) In $\triangle ABC$, given that $\angle A = 24^\circ$, $b = 12.5$ m, and $c = 13.2$ m.
- (c) In $\triangle ABC$, given that $a = 17$ m, $b = 18$ m, and $c = 26$ m.
- (d) In $\triangle ABC$, given that $\angle A = 52^\circ$, $\angle B = 47^\circ$, and $a = 25$ m.
- (e) In $\triangle ABC$, given that $\angle B = 43^\circ$, $\angle C = 73^\circ$, and $b = 19$ m.
- (f) In $\triangle ABC$, given that $a = 32$ m, $b = 30$ m, and $c = 28$ m.

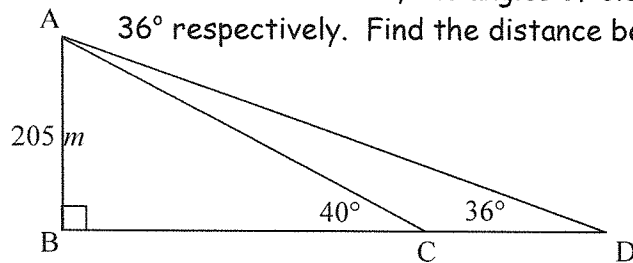
Solutions:

1. (a) $a^2 = (40)^2 + (25)^2 - 2(40)(25) \cdot \cos 20^\circ$ (b) $\frac{14.2}{\sin 38^\circ} = \frac{b}{\sin 67^\circ}$
- (c) $\frac{a}{\sin 20^\circ} = \frac{46}{\sin 130^\circ}$ (d) $(10.7)^2 = (9.5)^2 + (12.4)^2 - 2(9.5)(12.4) \cdot \cos \angle B$
- (e) $c^2 = (10)^2 + (9)^2 - 2(10)(9) \cdot \cos 66^\circ$ (f) $\frac{\sin \angle B}{14.2} = \frac{\sin 75^\circ}{21.3}$
2. (a) 18.6 cm (b) 21.2 cm (c) 20.5 cm (d) 57° (e) 10.4 m (f) 40°
3. (a) $\angle B = 57^\circ$, $a = 19.8$ cm, $b = 26.9$ cm (b) $a = 5.4$ m, $\angle B = 70^\circ$, $\angle C = 86^\circ$
- (c) $\angle A = 41^\circ$, $\angle B = 43^\circ$, $\angle C = 96^\circ$ (d) $\angle C = 81^\circ$, $b = 23.2$ m, $c = 31.3$ m
- (e) $\angle A = 64^\circ$, $a = 25.0$ m, $c = 26.6$ m (f) $\angle A = 67^\circ$, $\angle B = 60^\circ$, $\angle C = 53^\circ$



If diagrams are not included in any of the following questions it is advisable to sketch a diagram to aid in your solution to the problem. Round \angle 's to a whole degrees; length answers should be rounded to 1 decimal place and include units.

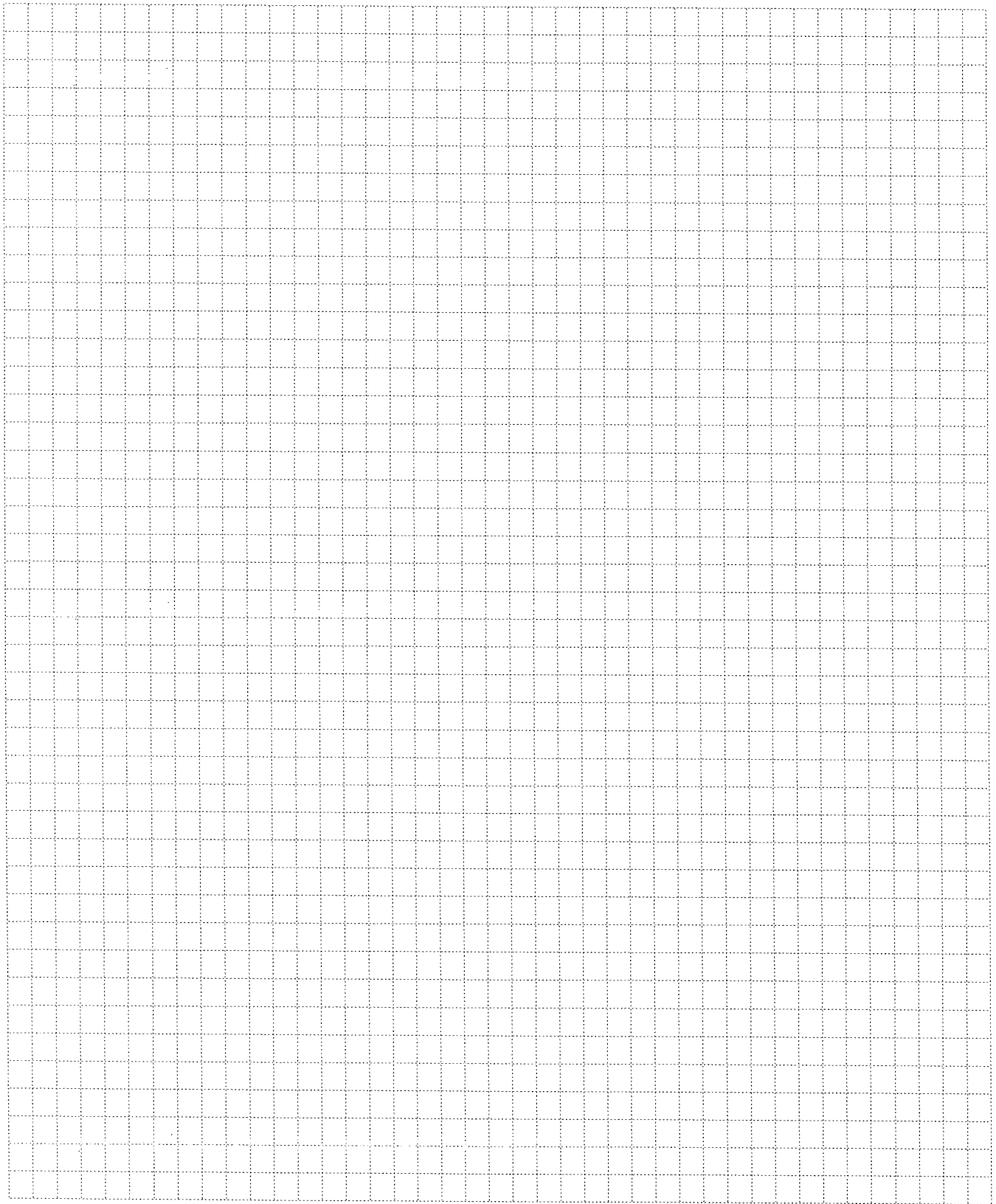
1. A squash player hits the ball 2.3 m to the side wall. The ball rebounds at an angle of 100° and travels 3.1 m to the front wall. How far is the ball from the player when it hits the front wall? (*Assume the player does not move after the shot.*)
2. A smokestack, AB , is 205m high. From two points C and D on the same side of the smokestack's base B , the angles of elevation to the top of the smokestack are 40° and 36° respectively. Find the distance between C and D . (*Diagram included.*)



3. Trina and Mazaheer are standing on the same side of a Red Maple tree. The angle of elevation from Mazaheer to the tree top is 67° and the angle of elevation from Trina to the tree top is 53° . If Mazaheer and Trina are 9.3 feet apart and Mazaheer is closer to the tree than Trina, how tall is the tree?
4. Two roads separate from a village at an angle of 37° . Two cyclists leave the village at the same time. One travels 7.5 km/h on one road and the other travels 10.0 km/h on the other road. How far apart are the cyclists after 2 hours?
5. A pilot is flying from Thunder Bay, Ontario to Dryden, Ontario, a distance of approximately 320 km. As the plane leaves Thunder Bay, it flies 20° off-course for exactly 80 km.
 - (a) After flying off-course, how far is the plane from Dryden?
 - (b) By what angle must the pilot change her course to correct the error?

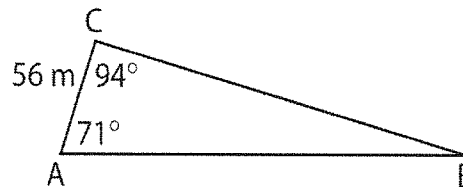
Solutions:

1. 4.2 m 2. 37.8 m 3. 28.3 feet 4. 12.1 km
5. (a) 246.4 km (b) approximately 26° turn towards Dryden.

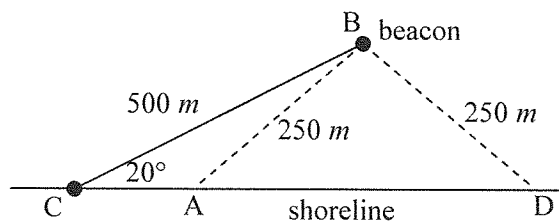


If diagrams are not included in any of the following questions it is advisable to sketch a diagram to aid in your solution to the problem. Round \angle 's to whole degrees; length answers should be rounded to 1 decimal place and include units.

- To calculate the height of a tree, Marie measures the angle of elevation from a point A to be 34° . She then walks 10 feet directly toward the tree, and finds the angle of elevation from the new point B to be 41° . What is the height of the tree?
- To measure the distance from a point A to an inaccessible point B, a surveyor picks out a point C and measures $\angle BAC$ to be 71° . He moves to point C, a distance of 56 m from point A, and measures $\angle BCA$ to be 94° How far is it from A to B? (Diagram below.)

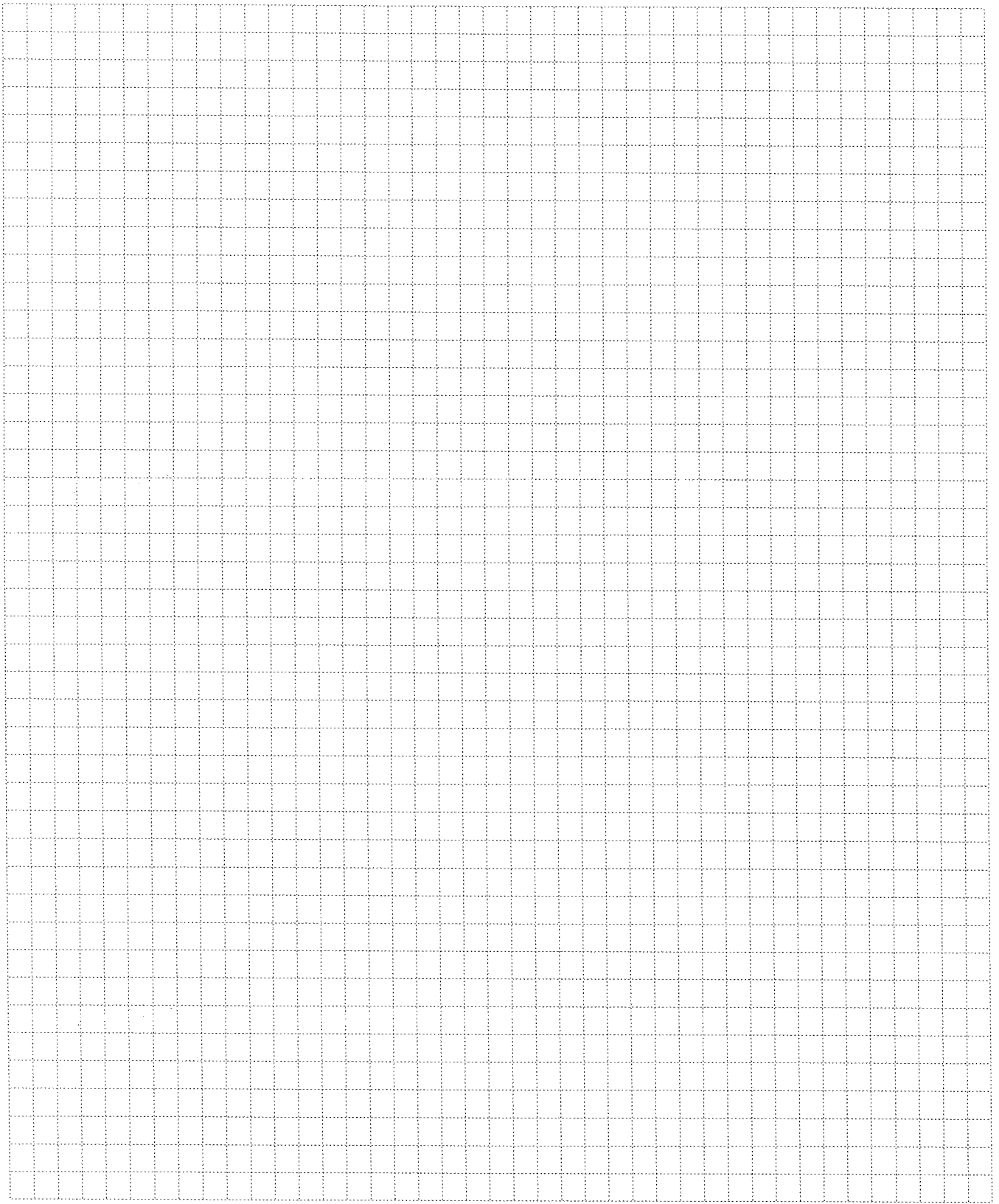


- A radar tracking station locates an oil tanker at a distance of 7.8 km, and a sailboat at a distance of 5.6 km. At the station, the angle between the two ships is 95° . How far apart are the ships?
- Two islands A and B are 5 km apart. A person took a vacation from island B and travelled 7 km to a third island C. At island B the angle separating island A and island C was 34° . While on this vacation the person decided to visit island A. Calculate how far the person will have to travel to get to island A from island C.
- The light from a rotating offshore beacon can illuminate effectively up to a distance of 250 m. From a point on the shore that is 500 m from the beacon, the sight line to the beacon makes an angle of 20° with the shoreline. What length of shoreline is effectively illuminated by the beacon? (i.e. solve for the length of AD in the diagram below.)



Solutions:

- 30.1 feet
- 215.8 m
- 10.0 km
- 4.0 km
- Hint: When you solved for $\angle CAB$ the angle 43.20 actually is the value for angle(s) $\angle ADB$ and $\angle DAB$ ($\triangle ABD$ is isosceles since $AB = BD \therefore \angle ADB = \angle DAB$) and the result of 43.20 is too small for $\angle CAB$. (using the SAT we get a value of 136.80) so the length of shoreline that is effectively illuminated by the beacon is 364.5 m.



Making a Clinometer

A clinometer is a device used to measure the angle of inclination between two points.

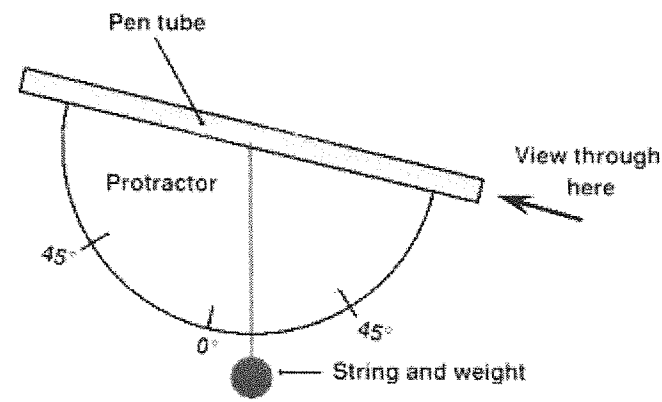
The following items are needed to make a simple clinometer:

1. Protractor: The plastic type found in drawing sets and used by Math departments are fine, but larger ones can be easier to read.
2. Narrow tube: A thin tube such as the body of a ballpoint pen. This will be the 'sight' mounted on the protractor.
3. String or thread: About 30 cm (1 foot) of thin but **strong** string.
4. Weight: Anything small and heavy which can be attached to one end of the string to keep it taut, such as a metal nut or fishing weight.
5. Glue or sticking tape: To assemble your clinometer. Glue must NOT dissolve in water!

Method

1. Glue or tape one end of the string firmly to the center of the protractor where all the lines meet. This will be half way along its flat base. Make sure that the string can hang down freely when the protractor is held with the flat side at the top.
2. Attach (glue or tape) the 'sight' tube along the straight edge of the protractor.
3. Attach your weight to the free end of the string and check again that the string can move freely as you tilt the protractor up and down.

That's all there is to it. You now have a clinometer which, hopefully, looks something like the one below.



Note: The angle between 0° and the string is the angle of inclination.

Clinometer Exercises

Exercise 1: (Determine the height of the classroom)

In your group, one of you stand back from the wall a few meters and look through the tube of the clinometer to the top of the wall. The other people will need to record the angle of inclination from the clinometer, the height of the centre of the clinometer, and the distance from the wall to the person using the clinometer. With this information draw and label a diagram of this situation and use trigonometry to find the height of the wall. Check your answer by measuring the height of the wall.

Exercise 2: (Determine the width of a classroom wall)

This can be done in many ways but the method you will use here will involve adapting the clinometer to find a horizontal angle. In your group, one of you go to one end of the wall that you are going to measure and then back up along the other wall a few meters (measure and record this distance). Hold the clinometer horizontally with the tube side of the clinometer against the wall. Now the tube of the clinometer is directed to one end of the wall. Another person in the group will need to try and direct the weight and string to the other end of the wall and record the angle between the string and tube.

- (a) With this information draw and label a diagram of this situation and use trigonometry to find the width of the wall. Check your answer by measuring the width of the wall.
- (b) Instead of backing up from one end of the wall, try to solve this problem by backing up from any spot on the wall and use the clinometer to find the angle between the ends of the wall.
- (c) Can you think of a better way to adapt the clinometer to find horizontal angles?

Clinometer Tasks

Task 1: Finding the Height of an object without approaching it

You are an unknown distance from a wall. Your task is to determine the height of the wall without measuring it. You have a metre stick and a clinometer. You can move around, but you are unable to approach the wall.

- (a) Create a detailed plan to determine the height of the wall.
- (b) Use your plan to determine the height of the wall.

Task 2: Finding the Width of an object without approaching it

You are an unknown distance from a wall. Your task is to determine the width of the wall without measuring it. You have a metre stick and a clinometer. You will be given the height of the wall. You can move around, but you are unable to approach the wall.

- (a) Create a detailed plan to find the width of the wall.
- (b) Use your plan to determine the width of the wall.

Trig Tasks

Task 1:

Jack and Jill are standing on Parliament Hill looking at the Peace Tower. The travel guide they have indicates that the height of the tower is 92 m. Using only a clinometer how could they calculate the distance between them and the base of the tower? *Make a list of steps that would find the answer. Guess a reasonable angle measure and use the steps to estimate the distance. Be sure to draw a diagram.*

Task 2:

Jack and Jill are standing in front of the Supreme Court House on Wellington Street. They are standing 20 m from one edge of the Court House and 24 m from the other edge of the Court House. Using only a clinometre determine the width of the Court House. *Make a list of steps that would find the answer. Guess a reasonable angle measure and use the steps to estimate the distance. Be sure to draw a diagram.*

Task 3:

Jack and Jill are standing in front of the new War Museum. They want to know the height of the tallest point of the building. They have a 15 m tape measure as well as a clinometre. The only problem is that they can't get close to the building due to construction. Devise a plan to find the height. *Make a list of steps that would find the answer. Be sure to draw a diagram.*

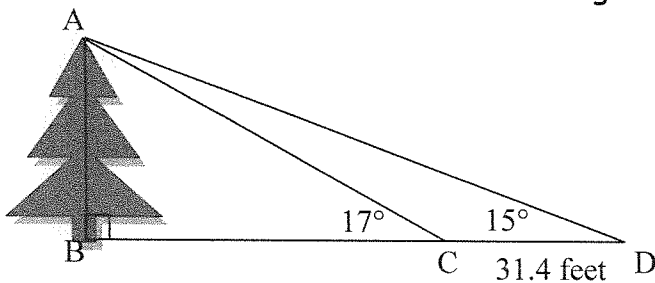
TOPICS:

1. *Right angle triangles*
 - Primary trig ratios - SOH CAH TOA
 - Pythagorean Theorem
2. *Acute triangles*
 - Sine Law
 - Cosine Law
3. *Solving triangles* - choose a strategy
4. *Application problems* - choose a strategy

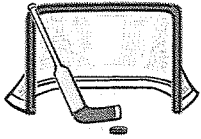
REVIEW QUESTIONS:

Problem 1: In $\triangle ABC$, given that $\angle B = 43^\circ$, $\angle C = 73^\circ$, and $b = 19$ m. Solve the triangle

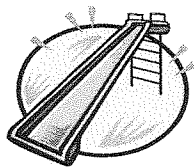
Problem 2: Jillian stood at a distance admiring a magnificent Douglas Fir. Jillian measured the angle of elevation to the top of the tree and found it to be 15° . Jillian then walked 31.4 feet closer to the tree. This time the angle of elevation to the top of the tree was 17° . Calculate the height of the tree to the nearest tenth of a metre



Problem 3: Jill and her friends built an outdoor hockey rink. Their hockey goal line is 5 feet wide. Jill shoots a puck from a point where the puck is 5 yards from one goal post and 6 yards from the other goal post. Within what angle must Jill make her shot to hit the net? Draw the diagram first. (3 feet per yard)



Problem 4: The longest slide in the world is in Vermont, U.S.A. It drops 213 m in a horizontal distance of 1200 m. How long is the slide? What is its angle of inclination? Draw a diagram first.



Solutions: 1. $\angle A = 64^\circ$, $a = 25.0$ m, $c = 26.6$ m 2. 68 ft 3. about 14° 4. 1219 m, 10 degrees

Practice Test : Trigonometry

This is the communication rubric that I will be using to evaluate communication on every test.
Please look at it and see what you have to do to receive 10/10

	Incomplete 0	Unacceptable 3.0 4.0	Poor 5.2 5.5 5.8	Acceptable 6.2 6.5 6.8	Good 7.2 7.5 7.8	Outstanding 8.4 8.9 9.5 10
Technical correctness of solutions	All or most solutions are blank	No solutions are correct or many left blank	<u>Few</u> solutions are technically correct	<u>Some</u> solutions are technically correct	<u>Most</u> solutions are technically correct	<u>All</u> or <u>almost all</u> solutions are technically correct
Presentation of solutions	All or most solutions are blank	No evidence of presentation or many solutions left blank	Solutions to <u>few</u> problems stand alone	Solutions to <u>some</u> problems can stand alone	Solutions to <u>most</u> problems can stand alone	Solutions to <u>all</u> or <u>almost all</u> problems can stand alone

Read each question carefully and follow the instructions.
Write your answers in the spaces provided.
Show *all* of your work for maximum marks.

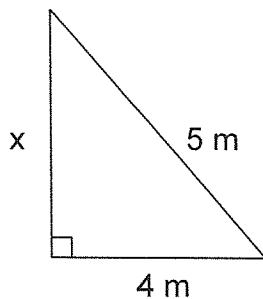
Useful Formulae:

$$\text{SOH CAH TOA} \quad c^2 = a^2 + b^2 - \frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c} \quad c^2 = a^2 + b^2 - 2ab \cos C$$

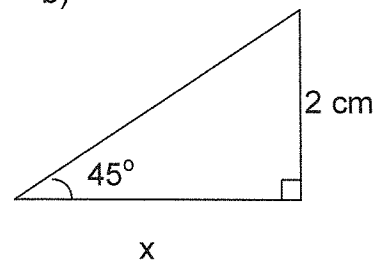
Knowledge & Understanding: Please show your work. (8 marks)

1. Find the missing value on each triangle using the proper trigonometry law or theory.
(8 marks)

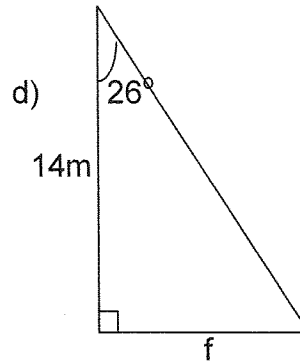
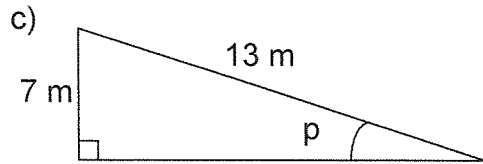
a)



b)

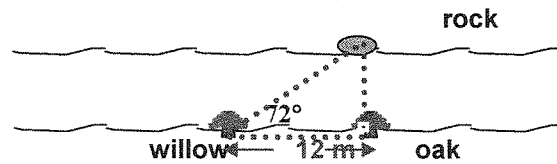


Practice Test : Trigonometry



Application: Please include labelled diagrams for marks. (15 marks)

1. To measure the width of a river, Trista used a large rock, an oak tree, and a willow tree, which are positioned as shown. How wide is the river (to one decimal place)? (2 marks)

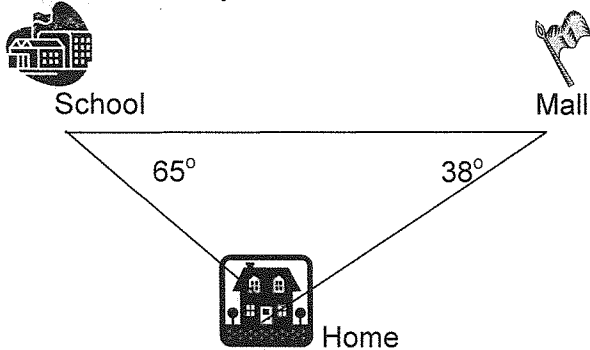


2. A ladder 3.5 m long is leaning against a wall. The foot of the ladder is 1.0 m from the wall. What angle does the ladder make with the ground, to the nearest degree.



Practice Test : Trigonometry

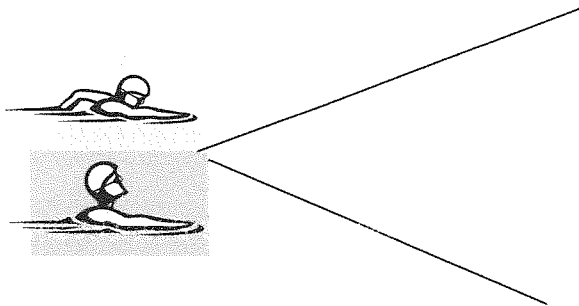
3. The distance between school and the mall is 2.5 km. The angle between the school and home with respect to the mall is 65° , and the angle between the mall and home is 38° . If you are at home, are you closer to the mall or school? (diagram is not to scale) (4 marks)



4. Sam and Jenn are shopping when they notice a really nice purse. Sam is 50 feet from the purse and Jenn is 72 feet away. The purse is between them at an angle of 32° . How far is Sam from Jenn? (3 marks)



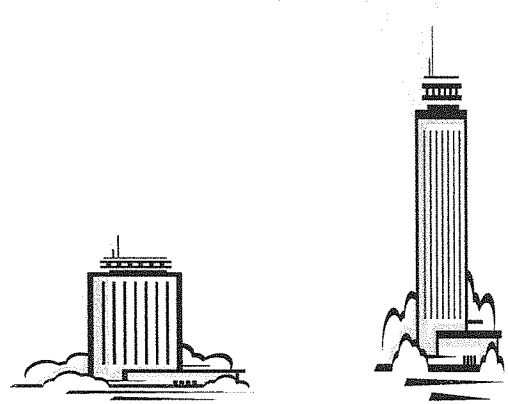
5. Two swimmers part at a beach. One swims at 8 km/hr and the other at 6 km/hr. After one hour the swimmers are 4.5 km apart. What was the original angle at which the swimmers left each other? (3 marks)



Practice Test : Trigonometry

TIPS: (8 marks)

1. Two buildings are 38 m apart. From the top of the shorter building, the angle of elevation to the top of the taller building is 27° and the angle of depression of the base is 35° . Determine the height of each building.



2. Two cars head off down roads that are 57° apart. One car is traveling at 60 km/h and the other car is traveling at 75 km/h. How far apart are the cars after 3 hours? Include a diagram.
(3 marks)