

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

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

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

$$\text{alt} = b \sin A$$

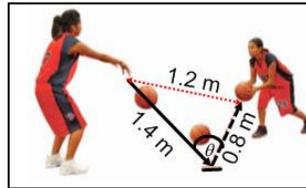
PART A – Multiple Choice (15 Marks)

Shade in the letter corresponding to the correct solution on the scantron sheet that is provided.

1. For $\triangle ABC$, $\angle A = 53^\circ$ and $\angle C = 61^\circ$, which side of the triangle is the **smallest**?
 [A] a [B] b [C] c [D] not enough information

2. In a basketball game, a player executing a bounce pass needs to know how the ball should be directed toward the floor so that it will bounce up into the hands of the intended receiver. In the diagram below, the **measure of the angle θ** to the nearest degree is...

- [A] 31° [B] 35°
 [C] 52° [D] 59°

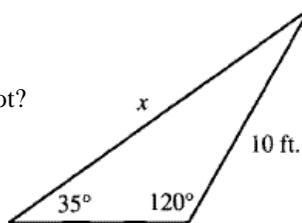


3. Which set of measurements **will not** produce a triangle?

- [A] $\angle A = 25^\circ$, $a = 5.0$ m, $b = 12.0$ m
 [B] $\angle A = 25^\circ$, $a = 9.2$ m, $b = 12.0$ m
 [C] $\angle A = 25^\circ$, $a = 12.0$ m, $b = 12.0$ m
 [D] $\angle A = 25^\circ$, $a = 14.5$ m, $b = 12.0$ m

4. Determine the **length of side x** , to the nearest tenth of a foot?

- [A] 17.4 ft [B] 15.1 ft
 [C] 12.2 ft [D] 6.6 ft

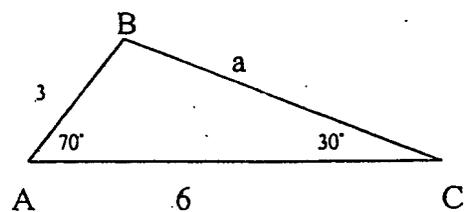


5. Malia leaves her campsite and hikes 4 km in a $S70^\circ E$ direction. She then turns and hikes 3 km in a $N25^\circ E$ direction. How would you determine her distance from the campsite?

- [A] the sine law [B] the cosine law [C] primary trig ratios [D] not possible

6. In the diagram below, which of the following could be used to find **side a** ?

- [A] $\tan 70^\circ = \frac{a}{3}$ [B] $\frac{a}{\sin 70^\circ} = \frac{6}{\sin 30^\circ}$
 [C] $a^2 = 3^2 + 6^2 - (3)(6) \cos 70^\circ$ [D] $\frac{a}{\sin 70^\circ} = \frac{6}{\sin 80^\circ}$

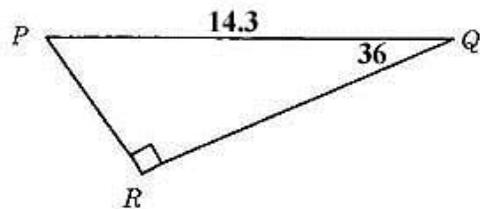


7. A search helicopter with an altitude of 1500m above ground spots a lost boy huddled on a beach at an angle of depression of 40° . Horizontally, how far is the helicopter from the boy?

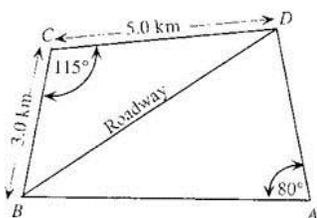
- [A] 1787.6m [B] 1258.6m [C] 2333.6m [D] 1958.1m

8. In the diagram shown, what is the **length of q** to the nearest tenth?

- [A] 8.4 [B] 8.9
 [C] 10.4 [D] 11.6



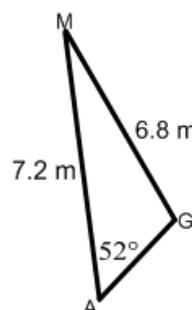
9. The course manager needed to clear the snow on a roadway used to transport people and equipment between checkpoints labeled B and D of a biathlon course, as shown below. An equation that could be used to determine the length of the roadway, BD, is...



- [A] $BD = \frac{5.0 \sin 115^\circ}{\sin 80^\circ}$ [B] $BD = \sqrt{3.0^2 + 5.0^2 - 2(3.0)(5.0) \cos 115^\circ}$
 [C] $BD = \frac{3.0 \sin 115^\circ}{\sin 80^\circ}$ [D] $BD = \sqrt{3.0^2 + 5.0^2 + 2(3.0)(5.0) \cos 115^\circ}$

10. In the obtuse triangle shown, what is the **measure of angle G**?

- [A] 123° [B] 57°
 [C] 5° [D] 132°



PART B – Open Response (25 Marks)

Show all your work in the space that is provided.

1. Solve $\triangle PQR$, given that $p = 11 \text{ cm}$, $q = 14 \text{ cm}$ and $\angle P = 42^\circ$. **If there is more than one triangle possible for the measurements provided, sketch both triangles and solve BOTH triangles.** [8]

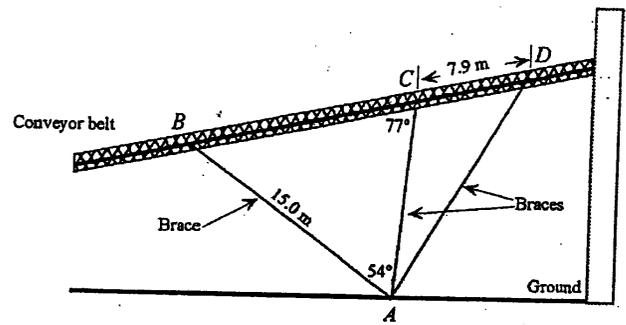
2. The posts of a soccer goal are 24 ft apart. A player is standing at a point 50 ft from one post and 42 ft from the other. Within what angle must the player kick the ball to score a goal? **(Must include a detailed sketch)** [3]

Angle = _____

3. A hiker leaves base camp in Fundy National Park and travels $N20^\circ W$ for 0.7 km. The hiker then travels $S65^\circ W$ until he is directly west of the camp. How far is the hiker from the camp, to the nearest tenth of a kilometer? **(Must include a detailed sketch)** [4]

Distance from Camp = _____

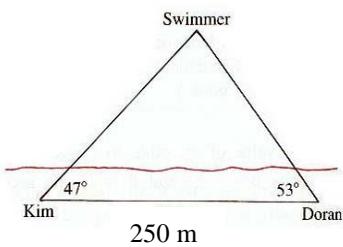
4. An engineer is working with a cross-section diagram that represents a conveyor belt is used to move pulp into the plant. Two braces, AC and AD , have to be replaced. **Determine the lengths of the two braces to the nearest tenth of a meter.** [5]



Length of $AC =$ _____

Length of $AD =$ _____

5. Two lifeguards, Doran and Kim, are stationed 250 m apart on the shore of Parlee Beach in Shediac. They both spot a swimmer in distress. Who is closer to the swimmer and by how much? [5]



Closest Swimmer is _____ by _____ meters.