4 Chapter Review

FREQUENTLY ASKED Questions

Q: In a *SSA* situation, how do you know how many triangles are possible?

A: In a *SSA* situation, you know the lengths of two sides and the measure of an angle that is opposite one of the sides. After drawing a diagram for the situation, you should first determine the height of the triangle, opposite the known angle. Then you can determine the number of possible triangles by comparing the height of the triangle with the length of the side that is opposite the given angle.

- If the height is greater than the length of the side that is opposite the given angle, no triangle is possible.
- If the height equals the length of the side that is opposite the given angle, one triangle is possible.
- If the height is less than the length of the side that is opposite the given angle, two triangles may be possible:
  - If the length of the side that is opposite the given angle is less than the length of the other given side, two triangles are possible.
  - If the length of the side that is opposite the given angle is greater than or equal to the length of the other given side, one triangle is possible.

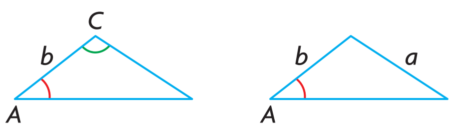
Study *Aid*

- See Lesson 4.3, Examples 1 to 3.
- Try Chapter Review Questions 5 and 7.

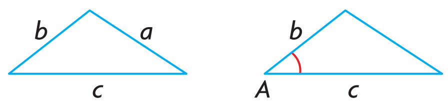
Q: When solving a problem that can be modelled by an obtuse triangle, how do you decide whether to use the sine law or the cosine law?

A: Use the same decision process that you used for acute triangles:

- Draw a clearly labelled diagram. Include given information and information you can deduce.
- Use the sine law if you have either of the following situations:



- Use the cosine law if you have either of these situations:



Study *Aid*

- See Lesson 4.4, Examples 1 and 2.
- Try Chapter Review Question 8.

PRACTISING

Lesson 4.1

1. Describe, using examples, the relationships between the primary trigonometric ratios for supplementary angles.

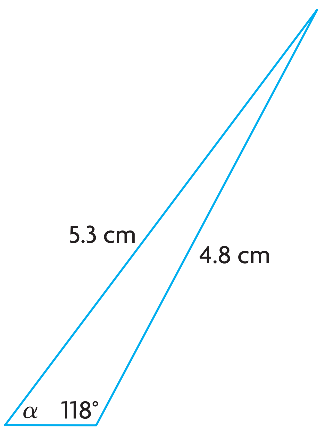
2. Determine each trigonometric ratio. Predict another angle that has an equal or opposite ratio. Check your prediction.

a) sin 122° **c)** cos 100°
b) sin 58° **d)** tan 15°

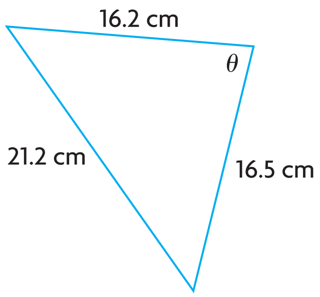
Lesson 4.2

3. Determine the unknown angle measure that is indicated in each triangle, to the nearest tenth of a unit.

a)



b)



4. In △*ABC*, ∠*A* = 125°, ∠*B* = 30°, and the side between these angles is 8.0 cm long. Solve the triangle. Round each measure to the nearest tenth of a unit, as necessary.

Lesson 4.3

5. For each description, determine the number of possible triangles. Draw the triangle(s) to support your answer.

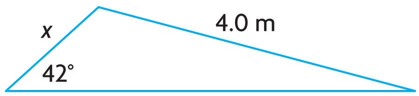
a) In △*ABC*, ∠*A* = 53°, a = 7 m, and b = 15 m.

b) In △*ABC*, ∠*A* = 27°, a = 5 m, and b = 6 m.

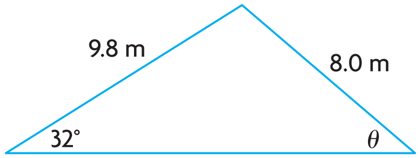
c) In △*ABC*, ∠*A* =115°, a = 23.0 m, and b = 6.0 m.

6. Determine the unknown side length or angle measure that is indicated in each triangle, to the nearest tenth of a unit.

a)



b)



7. A 4.3 m ramp for a mountain-bike trail is inclined at a 15° angle with the ground. The length of the support that creates the incline is 1.3 m.

a) Determine the distance along the ground between the base of the support and the beginning of the ramp, to the nearest tenth of a metre.

b) How high above the ground is the take-off point on the ramp, to the nearest tenth of a metre?

Lesson 4.4

8. An airplane passes over an airport and continues flying on a heading of N70°W for 3 km. The airplane then turns left and flies another 2 km until the airport is exactly due east of its position. What is the distance between the airplane and the airport, to the nearest tenth of a kilometre?