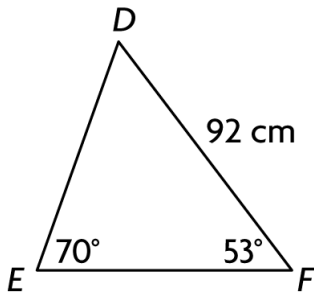


Foundations 20 Final Review (Ch. 3 & 4)

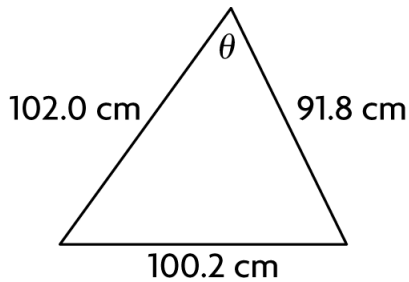
Multiple Choice

Identify the choice that best completes the statement or answers the question.

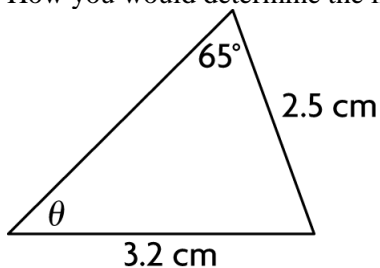
- ___ 1. Determine the length of f to the nearest tenth of a centimetre.



- a. 78.6 cm
b. 79.0 cm
c. 79.4 cm
d. 78.2 cm
- ___ 2. In $\triangle ABC$, $a = 4.1\text{ cm}$, $b = 4.4\text{ cm}$, and $\angle B = 64^\circ$. Determine the measure of $\angle C$ to the nearest degree.
- a. 59°
b. 57°
c. 61°
d. 55°
- ___ 3. Determine the measure of θ to the nearest degree.

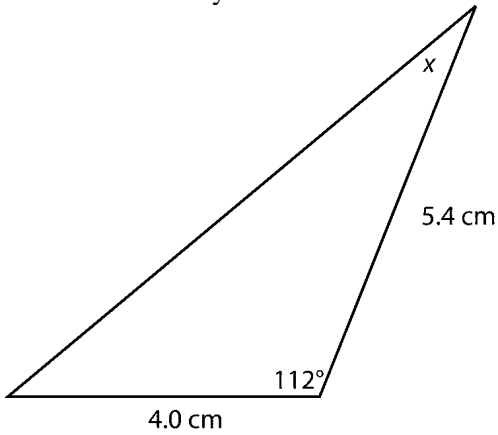


- a. 60°
b. 59°
c. 61°
d. 62°
- ___ 4. In $\triangle LMN$, $l = 27.0\text{ cm}$, $m = 31.4\text{ cm}$, and $\angle N = 82^\circ$. Determine the measure of n to the nearest tenth of a centimetre.
- a. 39.0 cm
b. 38.5 cm
c. 39.5 cm
d. 38.0 cm
- ___ 5. How you would determine the indicated angle measure, if it is possible?



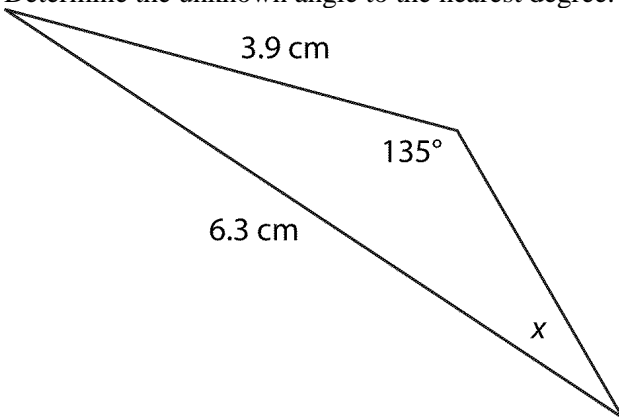
- a. not possible
b. primary trigonometric ratios
c. the cosine law
d. the sine law

_____ 6. Which law could you use to determine the unknown angle in this triangle?



- a. neither the sine law nor the cosine law
- b. the cosine law only
- c. the sine law and the cosine law
- d. the sine law only

_____ 7. Determine the unknown angle to the nearest degree.



- a. 32°
- b. 18°
- c. 38°
- d. 26°

_____ 8. In $\triangle XYZ$, $\angle Y = 29^\circ$, $x = 15.4$ m, and $y = 12.0$ m.
Which statement is true for this set of measurements?

- a. This is not a SSA situation.
- b. This is a SSA situation; no triangle is possible.
- c. This is a SSA situation; only one triangle is possible.
- d. This is a SSA situation; two triangles are possible.

_____ 9. In $\triangle NOP$, $OP = 175$ mm and $\angle O = 57^\circ$.
What is the height of the triangle from base ON ?

- a. 151 mm
- b. 147 mm
- c. 143 mm.
- d. 139 mm

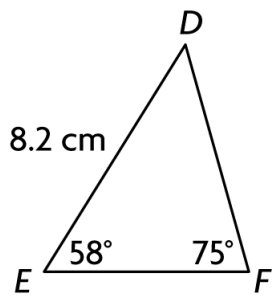
_____ 10. Solve for the unknown side length. Round your answer to one decimal place.

$$\frac{q}{\sin 30^\circ} = \frac{10.0}{\sin 80^\circ}$$

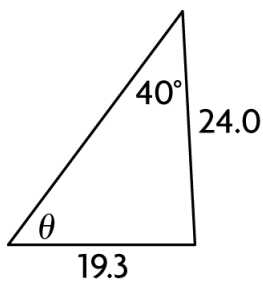
- a. 5.0
- b. 5.1
- c. 20.3
- d. 0.5

Short Answer

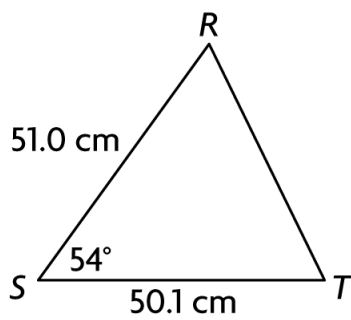
11. Determine the length of d to the nearest tenth of a centimetre.



12. Determine the measure of θ to the nearest degree.



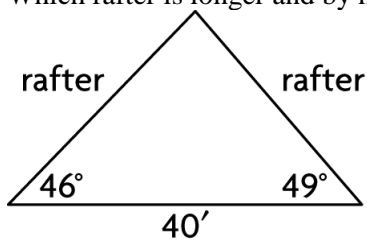
13. Determine the length of s to the nearest tenth of a centimetre.



14. In $\triangle ABC$, $a = 108 \text{ cm}$, $b = 100 \text{ cm}$, and $c = 124 \text{ cm}$. Determine the measure of $\angle C$ to the nearest degree.

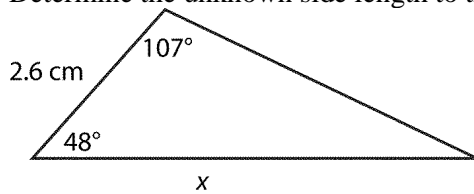
15. A kayak leaves a dock on Lake Athabasca, and heads due north for 2.8 km. At the same time, a second kayak travels in a direction $N70^\circ E$ from the dock for 3.0 km. Determine the distance between the kayaks, to the nearest tenth of a kilometre.

16. Which rafter is longer and by how much (to the nearest tenth of a foot)?

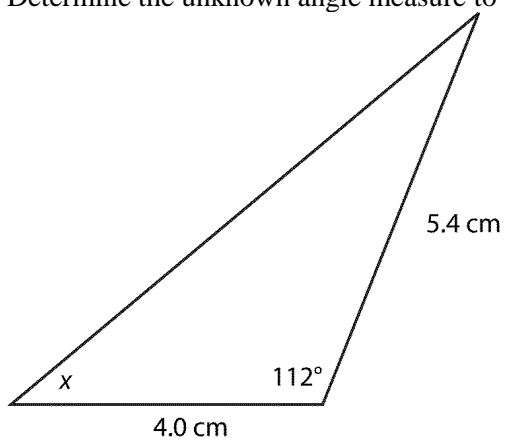


17. Calculate $\sin 20^\circ$ to four decimal places. Predict another angle that will have an equal or opposite trigonometric ratio.

18. Determine the unknown side length to the nearest tenth of a centimetre.



19. Determine the unknown angle measure to the nearest degree.



20. In $\triangle ABC$, $\angle A = 26^\circ$, $a = 8.5$ cm, and $b = 5.0$ cm. Determine the number of triangles (zero, one, or two) that are possible for these measurements. Draw the triangle(s) to support your answer.
21. In $\triangle ABC$, $\angle A = 58^\circ$, $a = 10.5$ cm, and $b = 11.4$ cm. Determine the number of triangles (zero, one, or two) that are possible for these measurements. Draw the triangle(s) to support your answer.

Problem

22. In $\triangle QRS$, $q = 8.9$ cm, $r = 3.8$ cm, and $s = 7.2$ cm. Solve $\triangle QRS$ by determining the measure of each angle to the nearest degree. Show your work.
23. While golfing, Vikram hits a tee shot from point T toward a hole at H . However, the ball veers 20° and lands at B . The scorecard says that H is 320 m from T . Vikram walks 200 m to his ball. Sketch a diagram of this situation. How far, to the nearest metre, is his ball from the hole? Show your work.
24. A landowner says that his property is triangular, with one side 500 m long and another side 350 m long. The opposite angle to the 350 m side measures 20° . Determine two possible lengths of the third side, to the nearest metre. Show your work.

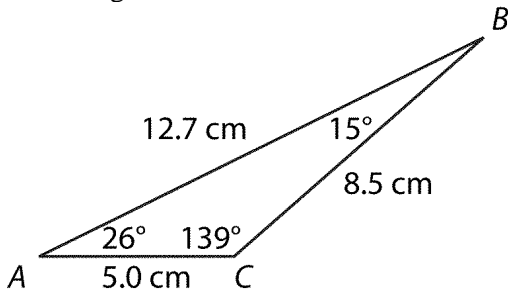
**Foundations 20 Final Review (Ch. 3 & 4)
Answer Section**

MULTIPLE CHOICE

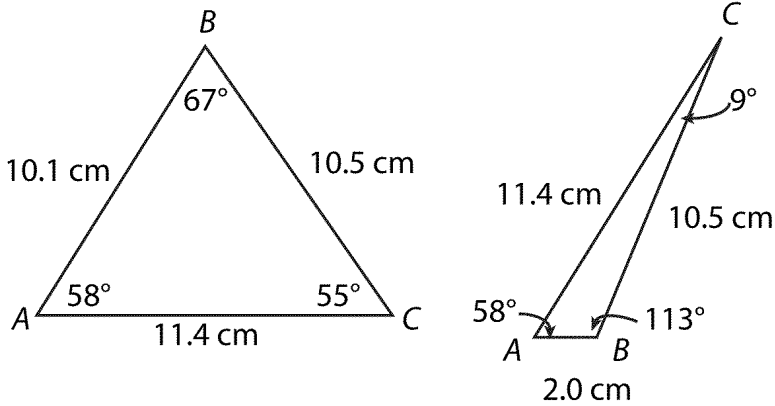
- | | | | | |
|------|------|------|------|-------|
| 1. D | 2. A | 3. D | 4. B | 5. D |
| 6. C | 7. D | 8. D | 9. B | 10. B |

SHORT ANSWER

- | | |
|-------------------------|----------------------------------|
| 11. $d = 6.2$ cm | 12. $\theta = 53^\circ$ |
| 13. $s = 45.9$ cm | 14. $\angle C = 73^\circ$ |
| 15. 3.3 km | 16. Left rafter is 1.4 ft longer |
| 17. 0.3420; 160° | 18. 5.9 cm |
| 19. 40° | |
| 20. one triangle: | |



21. two triangles:



PROBLEM

22.

By the cosine law,

$$q^2 = r^2 + s^2 - 2rs \cos Q$$

$$8.9^2 = 3.8^2 + 7.2^2 - 2(3.8)(7.2) \cos Q$$

$$8.9^2 - 3.8^2 - 7.2^2 = -2(3.8)(7.2) \cos Q$$

$$12.93 = -54.72 \cos Q$$

$$-\frac{12.93}{54.72} = \cos Q$$

$$\cos^{-1}\left(-\frac{12.93}{54.72}\right) = \angle Q$$

$$103.6679\dots^\circ = \angle Q$$

$\angle Q$ measures 104° .

By the sine law,

$$\frac{\sin R}{3.8} = \frac{\sin 104^\circ}{8.9}$$

$$3.8 \left(\frac{\sin R}{3.8} \right) = 3.8 \left(\frac{\sin 104^\circ}{8.9} \right)$$

$$\sin R = 0.4142\dots$$

$$\angle R = \sin^{-1}(0.4142\dots)$$

$$\angle R = 24.4762\dots^\circ$$

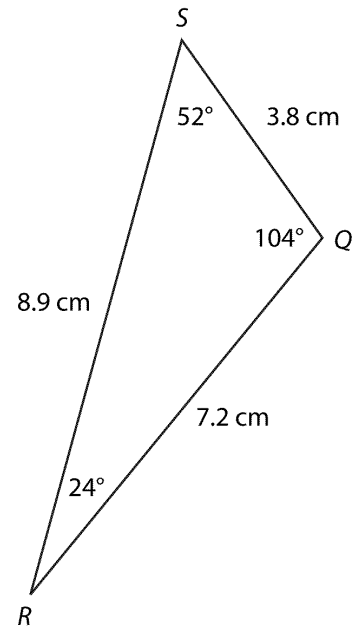
$\angle R$ measures 24° .

$$\angle Q = 180^\circ - \angle R - \angle S$$

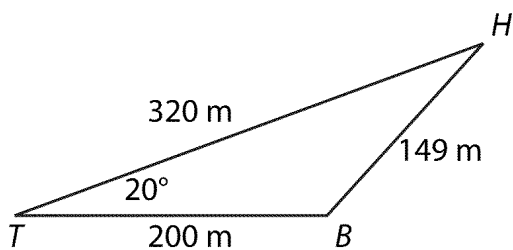
$$\angle Q = 180^\circ - 24.4762\dots^\circ - 103.6679\dots^\circ$$

$$\angle Q = 51.8578\dots^\circ$$

$\angle Q$ measures 52° .



23.



By the cosine law,

$$t^2 = h^2 + b^2 - 2hb \cos T$$

$$t^2 = 200^2 + 320^2 - 2(200)(320) \cos 20^\circ$$

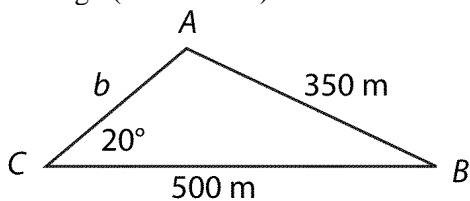
$$t^2 = 22\,119.344\dots$$

$$t = 148.725\dots$$

Vikram's ball is 149 m from the hole.

24.

A rough (not-to-scale) sketch of the situation is shown, with known sides and angles labelled.



The third side is either 165 m or 775 m.