Trigonometry Lesson #6: Practice Test

1. Which of the following could be used to determine the measure of the largest angle in an acute angled triangle when the length of all three sides is known?

A. SOH CAH TOA  B. Pythagorean Theorem  C. Sine Law  D. Cosine Law

2. Triangle RST has sides RS = 5.5 cm, RT = 3.9 cm, and ST = 4.8 cm. The largest angle in the triangle, to the nearest tenth of a degree, is

A. 43.8°  B. 58.5°  C. 77.7°  D. 79.3°

Use the following information to answer the next two questions.

In triangle ABC, angle BAC = 60°, angle ABC = 72°, and AC = 8 cm.

3. Which of the following equations can be used to calculate the length of AB in the diagram?

A. \( \frac{AB}{\sin 60°} = \frac{8}{\sin 72°} \)
B. \( \frac{AB}{\sin 72°} = \frac{8}{\sin 60°} \)
C. \( \frac{AB}{\sin 48°} = \frac{8}{\sin 72°} \)
D. \( \frac{AB}{\sin 48°} = \frac{8}{\sin 60°} \)

4. The length of AB, to the nearest tenth, is

A. 6.3 cm  B. 6.9 cm  C. 7.3 cm  D. 8.8 cm

\[ AB = \frac{8 \sin 48°}{\sin 72°} \]

\[ AB = 6.3 \text{ cm} \]

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Use the following diagram to answer the next two questions.

5. To the nearest centimetre, the length of $YZ$ is
   
   A. 20 cm
   B. 22 cm
   C. 24 cm
   D. 26 cm

   $x^2 = (39)^2 + (57)^2 - 2(39)(57) \cos 19^\circ$

6. The area of triangle $XYZ$ to the nearest square centimetre is
   
   A. 362
   B. 367
   C. 372
   D. 377

   $h = 39 \sin 19^\circ$
   $A = \frac{1}{2} (57)(39 \sin 19^\circ)$

**Numerical Response 1.** An oil company drilling off shore has pipelines from platform Alpha and platform Beta to the same shore station Delta. Platform Alpha is 180 km on a bearing of 50° from Delta and platform Beta is 250 km on a bearing of 125° from Delta. Calculate the distance between platform Alpha and platform Beta to the nearest km.

\[d^2 = (180)^2 + (250)^2 - 2(180)(250) \cos 75^\circ\]
\[d^2 = 71600.29\]
\[d = 268\text{ km}\]

(Record your answer in the numerical response box from left to right.)

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Use the following diagram to answer the next three questions.

![Diagram of a triangle with angles and sides labeled.]

7. The length of $MN$, to the nearest tenth of a centimetre, is
   - A. 25.8  \( (MN)^2 = (64)^2 + (51)^2 - 2(64)(51) \cos 24^\circ \)
   - B. 27.1  \( (MN)^2 = 733.375 \)
   - C. 27.8  \( MN = 27.1 \, \text{cm} \)
   - D. 28.6

8. Which of the following is closest to the measure of angle $LMN$?
   - A. 48º  \( \cos M = \frac{(64)^2 + (27.1)^2 - (51)^2}{2(64)(27.1)} \)
   - B. 50º  \( \cos M = 0.6427 \)
   - C. 52º  \( \cos^{-1}(0.6427) = M \)
   - D. 54º  \( 50^\circ = M \)

9. The length of $LP$ to the nearest centimetre is
   - A. 43  \( \sin 50^\circ = \frac{M}{64} \)
   - B. 45
   - C. 47  \( 64 \sin 50^\circ = M \)
   - D. 49  \( 49 \, \text{cm} = m = LP \)
Use the following diagram to answer the next two questions.

2. The length of QS, to the nearest tenth of a centimetre, is ______.
   (Record your answer in the numerical response box from left to right.)

\[
\frac{QS}{\sin 59^\circ} = \frac{7.3}{\sin 71^\circ}
\]

\[
QS = \frac{7.3 \sin 59^\circ}{\sin 71^\circ}
\]

\[
QS = 6.6 \text{ cm}
\]

3. The measure of angle QSR, to the nearest degree, is ______.
   (Record your answer in the numerical response box from left to right.)

\[
\cos S = \frac{(6.6)^2 + (4.8)^2 - (5.2)^2}{2(6.6)(4.8)}
\]

\[
\cos^{-1}(0.6244) = S = 51^\circ
\]

\[
\cos S = 0.6244
\]

Use the following information to answer the next question.

The first hole at a golf course is 210 yards long in a direct line from the tee to the hole. Andrew Duffer hit his first shot at an angle of 15° off the direct line to the hole. The angle between his first shot and his second shot was 105°. His second shot landed in the hole.

10. The length of his second shot, to the nearest yard, was

   A. 30
   B. 56
   C. 105
   D. 188

\[
\frac{X}{\sin 15^\circ} = \frac{210}{\sin 105^\circ}
\]

\[
X = \frac{210 \sin 15^\circ}{\sin 105^\circ}
\]

\[
X = 56 \text{ yds}
\]
Use the following information to answer the next two questions.

In triangle PQR, angle QPR = 60°, RP = 6 cm, and QP = 8 cm.

11. The length of QR, to the nearest tenth of a cm, is
   A. 6.9
   B. 7.1
   C. 7.2
   D. 7.5

   \[ p^2 = 8^2 + 6^2 - 2(8)(6)\cos 60° \]
   \[ p^2 = 52 \]
   \[ p = 7.2 \text{ cm} \]

12. The ratio \( \frac{\sin Q}{\sin R} \), to the nearest hundredth, is
   A. 0.62
   B. 0.75
   C. 1.33
   D. 1.61

   \[ \frac{\sin Q}{r} = \frac{\sin R}{q} \]
   \[ \frac{q}{r} = \frac{b}{8} = 0.75 \]

13. Triangle LMN is obtuse angled at M and \( \angle MLN = 40° \). Sin LNM is equal to
   A. \( \frac{LM \sin 40°}{MN} \)
   B. \( \frac{LM}{MN \sin 40°} \)
   C. \( \frac{MN}{LM \sin 40°} \)
   D. \( \frac{MN \sin 40°}{LM} \)

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4. At 5 p.m., the distance between the tip of the minute hand on a clock and the tip of the hour hand is 17.4 cm. If the minute hand is 10 cm long, the length of the hour hand, to the nearest tenth of a centimetre, is _____.

(Record your answer in the numerical response box from left to right.)

\[
\begin{align*}
\text{Angle} & = \left( \frac{\pi}{2} \right) \text{ rotations} \left( \frac{360^\circ}{\text{rotation}} \right) \\
\text{Angle} & = 150^\circ \\
\sin \gamma & = \sin 150^\circ \\
10 & = 17.4 \\
\sin \gamma & = \frac{10 \sin 150^\circ}{17.4} \\
& = 0.2879 \\
\sin^{-1}(0.2879) & = \gamma \\
16.70^\circ & = \gamma \\
\end{align*}
\]

Use the following information to answer the next question.

A student has been given the following problem to solve.

"A pilot leaves an airport flying on a bearing of 165°. He changes direction and flies for 80 km on a bearing of 205°. He changes direction again and flies back to the airport. How far is he from the airport when he makes the second change in direction?"

14. The most appropriate method for solving this problem is

A. SOHCAHTOA  
B. the Sine Law  
C. the Cosine Law  
D. the problem cannot be solved without further information

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15. Mr. Post's two metre high fence has almost been blown down by the wind. As a temporary measure, he wants to tie a rope from the top of the fence to a peg one metre from the base of the fence. The fence has moved so that it is leaning $25^\circ$ to the vertical as shown. Determine, to the nearest tenth of a metre, the minimum length of rope required if he allows 50 cm for knots.

A. 1.7 m  
B. 2.3 m  
C. 2.6 m  
D. 3.1 m

\[
\begin{align*}
\gamma^2 &= (1)^2 + (2)^2 - 2(1)(2) \cos 115^\circ \\
\gamma^2 &= 6.190 \\
\gamma &= 2.587
\end{align*}
\]

Rope length $= 2.587 + 0.5 = 3.1 \text{ m}$

Use the following information to answer the next question.

On June 30, 1956, the world's largest free standing totem pole was erected in Beacon Hill Park in Victoria. Recently, a surveyor took measurements to verify the height, $h$, of the totem pole.

In the diagram, triangle $ABC$ lies in a vertical plane and triangle $BCD$ lies in a horizontal plane.

5. The height of the totem pole, to the nearest metre, is ______.

(Record your answer in the numerical response box from left to right.)

\[
\begin{align*}
\frac{d}{\sin 61^\circ} &= \frac{27.2}{\sin 71^\circ} \\
\tan 58^\circ &= \frac{h}{24.415} \\
d &= \frac{27.2 \sin 61^\circ}{\sin 71^\circ} \\
d &= 24.415 \text{ m}
\end{align*}
\]
Use the following information to answer the next three questions.

\[ PQ \text{ is a chord of a circle with centre } C \text{ and radius } 8 \text{ cm. Angle } CPQ \text{ is } 35^\circ. \]
Chord \( PQ \) is extended to the point \( R \) such that \( CR = 12 \text{ cm} \).

\[ \begin{align*}
\angle CRP &= R \\
\sin R &= \frac{\sin 35^\circ}{12} \\
\sin R &= 0.3824 \\
R &= 22.5^\circ
\end{align*} \]

- Determine the measure of \( \angle CRP \) to the nearest tenth of a degree.

\[ \begin{align*}
\frac{PR}{\sin 22.5^\circ} &= \frac{12}{\sin 35^\circ} \\
PR &= \frac{12 \sin 22.5^\circ}{\sin 35^\circ} \\
PR &= 17.6 \text{ cm}
\end{align*} \]

- Determine, to the nearest tenth of a centimetre, the length of \( PR \).

\[ \begin{align*}
\frac{PQ}{\sin 110^\circ} &= \frac{8}{\sin 35^\circ} \\
PQ &= \frac{8 \sin 110^\circ}{\sin 35^\circ} \\
PQ &= 13.1 \text{ cm}
\end{align*} \]

- Determine, to the nearest tenth of a centimetre, the length of the chord \( PQ \).

**Answer Key**

1. D  
2. C  
3. C  
4. A  
5. C  
6. A  
7. B  
8. B  
9. D  
10. B  
11. C  
12. B  
13. A  
14. D  
15. D  

**Numerical Response**

1. 
2. 
3. 
4. 
5. 

**Written Response**

- \( 22.5^\circ \)
- \( 17.6 \text{ cm} \)
- \( 13.1 \text{ cm} \)

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