Trigonometry Lesson #9:
Practice Test

The first nine questions of this test should be done without using a calculator.

1. Which of the following pairs of angles in standard position have the same reference angle?

   A. 62° and 152°
   B. 212° and 328°
   C. 149° and 319°
   D. 71° and 19°

2. The point (x, y) is on the terminal arm of an angle $\theta°$ in standard positio.n
   Which of the following statements must be correct?

   A. The point (y, x) is on the terminal arm of angle $\theta°$.
   B. The point $(x, -y)$ is on the terminal arm of angle $(180 - \theta)°$.
   C. The point $(-x, -y)$ is on the terminal arm of angle $(180 + \theta)°$.
   D. The point $(-x, y)$ is on the terminal arm of angle $(360 - \theta)°$.

3. In which quadrant is the sine ratio of an angle negative and the tangent ratio of the angle also negative?

   A. 4 **B.** 3 **C.** 2 **D.** 1

4. The terminal arm of angle θ in standard position passes through the point $(8, -6)$.
   The exact value of $\sin\theta$ is

   A. 0.6
   B. −0.6
   C. 0.8
   D. −0.8

5. Which of the following statements is true?

   A. $\cos 165° = \cos 15°$
   B. $\sin 287° = -\sin 17°$
   C. $\tan 156° = -\tan 24°$
   D. $\sin 200° = \sin 20°$

6. Determine the exact value of $\cos 210°$.

   A. $-\frac{\sqrt{3}}{2}$ **B.** $\frac{\sqrt{3}}{2}$ **C.** $-\frac{1}{2}$ **D.** $\frac{1}{2}$

7. Angle A terminates in the fourth quadrant with $\cos A = \frac{4}{5}$. The exact value of $\tan A$ is

$y \rightarrow (-)$ $\cos A = \frac{4}{5} = \frac{x}{r}$

$r^2 - x^2 = y^2$

$y = 3$ $\tan A = \frac{-3}{4}$

A. $\frac{4}{3}$

B. $\frac{3}{4}$

C. $-\frac{4}{3}$

D. $-\frac{3}{4}$

8. The largest solution to the equation $\tan\theta + 1 = 0$, $0° \le \theta \le 360°$, is $\theta = x°$. The value of x is

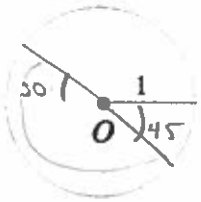
$\tan\theta = -1$ — Q2/4.

$\theta_R = 45°$

A. 45° **B.** 135°

C. 225° **D.** 315°

9. The diagram shows an initial arm of length 1 unit being rotated counterclockwise about the origin to form a circle of radius 1.



Two points on the circumference of the circle are $A\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ and $B\left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$. Rotating counterclockwise from A to B, the measure of angle AOB is

$30 + 90 + 45$

$165°$

A. 75°
B. 105°
C. 165°
D. 195°

A calculator is allowed for the remaining questions in this test.

10. Solve: $\sin A = -0.8290$, $0° \le A \le 360°$

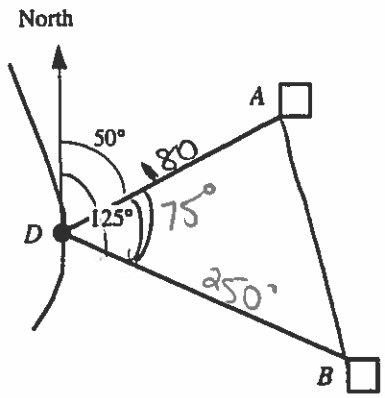
Q3+4.

$(-)$ $\theta_R \approx 56°$

A. 56°
B. 56°, 124°
C. 124°, 236°
D. 236°, 304°

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.



$a^2 = 94900 - 90000\cos 75$

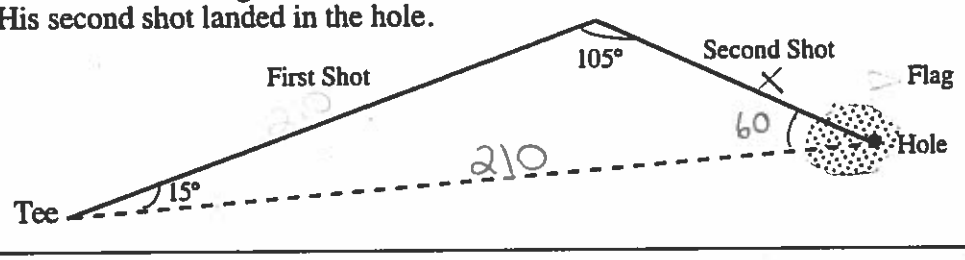
$a^2 = 71606.25$

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

2	6	8	

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.

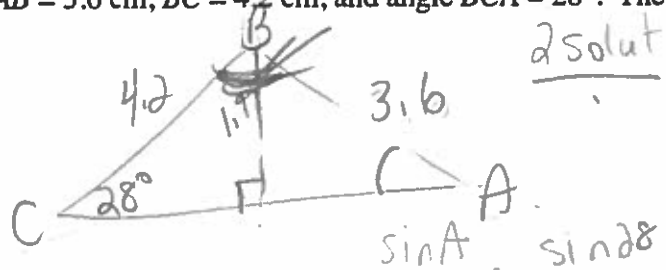


11. The length of his second shot, to the nearest yard, was

$\frac{x}{\sin 15} = \frac{210}{\sin 105}$.

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

12. Triangle *ABC* is drawn with $AB = 3.6$ cm, $BC = 4.2$ cm, and angle $BCA = 28°$. The measure of angle *ABC* is



2 solut

A. 33°
B. 119°
C. 33° or 147°
D. 5° or 119°

$\frac{\sin A}{4.2} = \frac{\sin 28}{3.6}$

$\angle A = 33, 147.50$

$\angle B = 5 \downarrow 119.$

119.

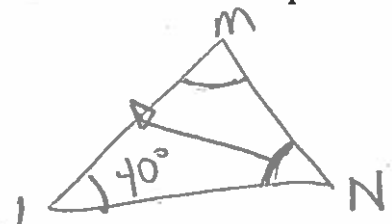
13. Triangle LMN is obtuse angled at M and $\angle MLN = 40°$. Sin LNM is equal to

A. $\dfrac{LM \sin 40°}{MN}$

B. $\dfrac{LM}{MN \sin 40°}$

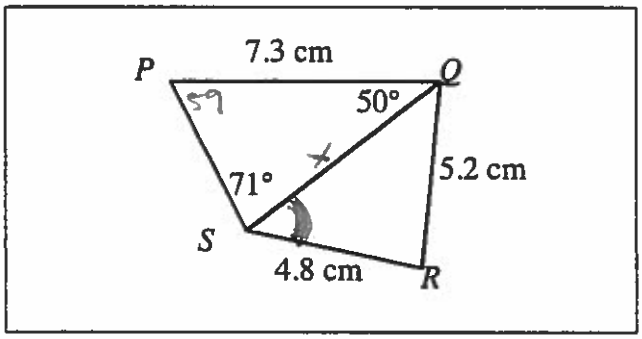
C. $\dfrac{MN}{LM \sin 40°}$

D. $\dfrac{MN \sin 40°}{LM}$



$\dfrac{\sin 40°}{MN} = \dfrac{\sin LNM}{LM}$

Use the following diagram to answer the next two questions.



Numerical Response **12.** The length of QS, to the nearest tenth of a centimetre, is _____ .
(Record your answer in the numerical response box from left to right.)

6	.	6	

$\dfrac{x}{\sin 59} = \dfrac{7.3}{\sin 71}$

Numerical Response **13.** The measure of angle QSR, to the nearest degree, is _____ .
(Record your answer in the numerical response box from left to right.)

5	1		

$\cos S = \dfrac{6.6^2 + 4.8^2 - 5.2^2}{2(6.6)(4.8)}$

$= \dfrac{39.7923}{63.5315}$

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."

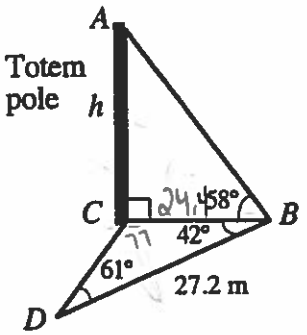
14. The most appropriate method for solving this problem is

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

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.



Numerical Response

4. The height of the totem pole, to the nearest metre, is _____ .

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

3	9		

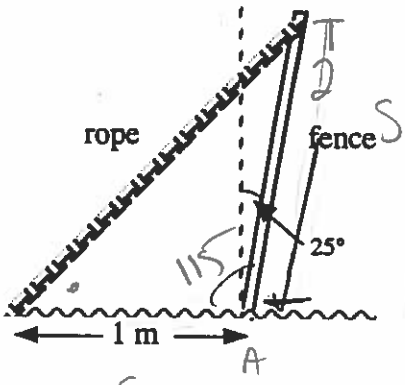
$\frac{CB}{\sin 61} = \frac{27.2}{\sin 77}$

$CB = 24.4$

$\tan 58 = \frac{h}{24.4}$

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° 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

$a^2 = 1^2 + 2^2 - 2(1)(2)\cos 115$

$= 5 - 4\cos 115$

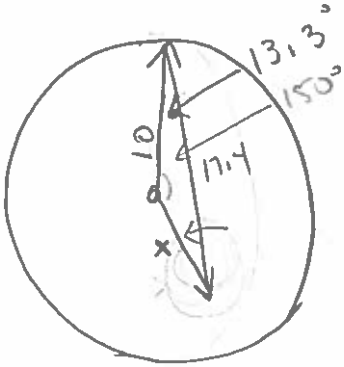
$= 2.6\text{ m} + 50\text{cm for knots.}$

Numerical Response

5. 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.)

8	.	0	



$\frac{\sin A}{10} = \frac{\sin 150}{17.4}$

$A = 16.7°$

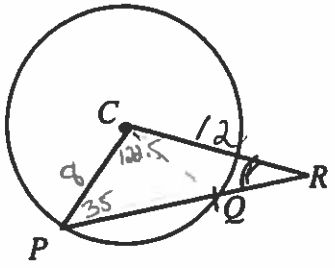
$\frac{X}{\sin 13.3} = \frac{17.4}{\sin 150}$

$= 8.006.$

Written Response #1 - 3 marks

Use the following information to answer the next three questions.

PQ is a chord of a circle with centre *C* and radius 8 cm. Angle *CPQ* is 35°. Chord *PQ* is extended to the point *R* such that *CR* = 12 cm.



- Determine the measure of ∠*CRP* to the nearest tenth of a degree.

$$\frac{\sin R}{8} = \frac{\sin 35}{12}$$

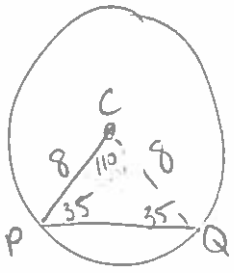
$$R = 22.5°$$

- Determine, to the nearest tenth of a centimetre, the length of *PR*.

$$\frac{PR}{\sin 122.5} = \frac{12}{\sin 35}$$

$$= 17.6\text{cm}$$

- Determine, to the nearest tenth of a centimetre, the length of the chord *PQ*.

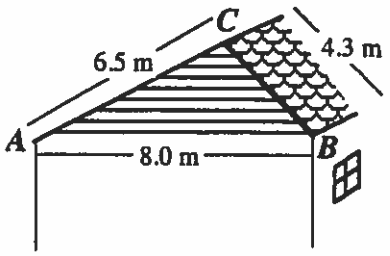


$$a^2 = 8^2 + 8^2 - 2(8)(8)\cos 110$$

$$= 128 - 128\cos 110$$

$$= 13.1\text{cm}$$

Written Response #2 - 2 marks



Violet and Thomas have formed their own student painting company. They have been given a contract to paint a small triangular portion of the sides of 100 houses. The area to be painted is shown in the diagram.

The paint they are going to use covers 10 m^2 per litre.

While looking through an old math book, Violet found a formula for the area of a triangle that did not require her to calculate the vertical height of the triangle.

The formula for area is $A = \frac{1}{2}ab \sin C$.

Using the above formula for the area of a triangle, determine, to the nearest 10 litres, the amount of paint required to paint the sides of 100 houses.

$A = \frac{1}{2}(4.3)(6.5)\sin$

$= \frac{1}{2}(4.3)(6.5)\sin 93.3$

$= 13.975 \sin 93.3$

$= 13.9\ m^2$

$\sin C = \frac{a^2+b^2-c^2}{2ab}$

$= \frac{4.3^2+6.5^2-8^2}{2(4.3)(6.5)}$

$= \frac{-3.26}{55.9}$

$C = 93.3$

$\times 100$

$1395 \div 10 = 140\text{L}$

Answer Key

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

Numerical Response

1. 268
2. 6.6
3. 51
4. 39
5. 8.0

Written Response

1. • 22.5° • 17.6 cm • 13.1 cm
2. 140 litres