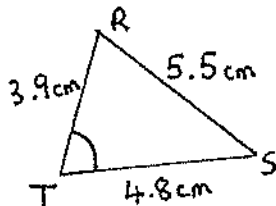


## Trigonometry- Sine and Cosine Laws Lesson #6: Practice Test

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.  $43.8^\circ$   
 B.  $58.5^\circ$   
**(C)  $77.7^\circ$**   
 D.  $79.3^\circ$

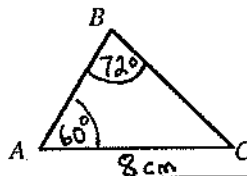


$$\cos T = \frac{(3.9)^2 + (4.8)^2 - (5.5)^2}{2(3.9)(4.8)} = 0.2137$$

$$\angle T = 77.7^\circ$$

Use the following information to answer the next two questions.

In triangle  $ABC$ , angle  $BAC = 60^\circ$ , angle  $ABC = 72^\circ$ , and  $AC = 8$  cm.



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

A.  $\frac{AB}{\sin 60^\circ} = \frac{8}{\sin 72^\circ}$

B.  $\frac{AB}{\sin 72^\circ} = \frac{8}{\sin 60^\circ}$

**(C)  $\frac{AB}{\sin 48^\circ} = \frac{8}{\sin 72^\circ}$**

D.  $\frac{AB}{\sin 48^\circ} = \frac{8}{\sin 60^\circ}$

$$\angle ACB = 180^\circ - 72^\circ - 60^\circ = 48^\circ$$

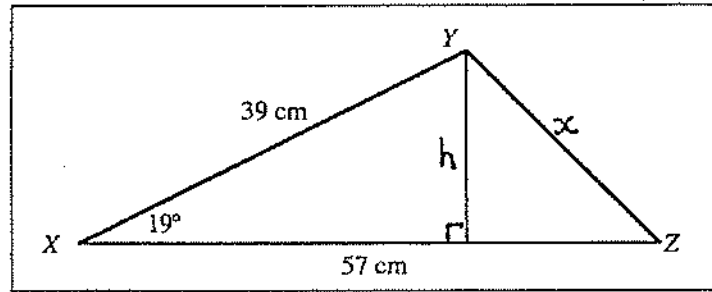
$$\frac{AB}{\sin 48^\circ} = \frac{8}{\sin 72^\circ}$$

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

$$AB = \frac{8 \sin 48^\circ}{\sin 72^\circ} = 6.3$$

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

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

$$= 566.224$$

$$x = \sqrt{566.224} = 23.79$$

YZ = 24 cm

6. The area of triangle XYZ to the nearest square centimetre is

- A. 362**
- B. 367
- C. 372
- D. 377

$$\sin 19^\circ = \frac{h}{39}$$

$$h = 39 \sin 19^\circ$$

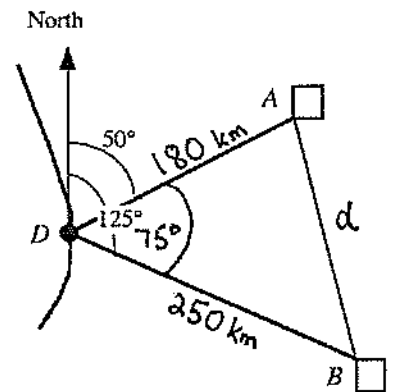
$$\text{Area} = \frac{1}{2}bh$$

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

$$= 362 \text{ (nearest whole number)}$$

**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  $50^\circ$  from Delta and platform Beta is 250 km on a bearing of  $125^\circ$  from Delta. Calculate the distance between platform Alpha and platform Beta to the nearest km.



$$d^2 = (180)^2 + (250)^2 - 2(180)(250) \cos 75^\circ$$

$$= 71606.29$$

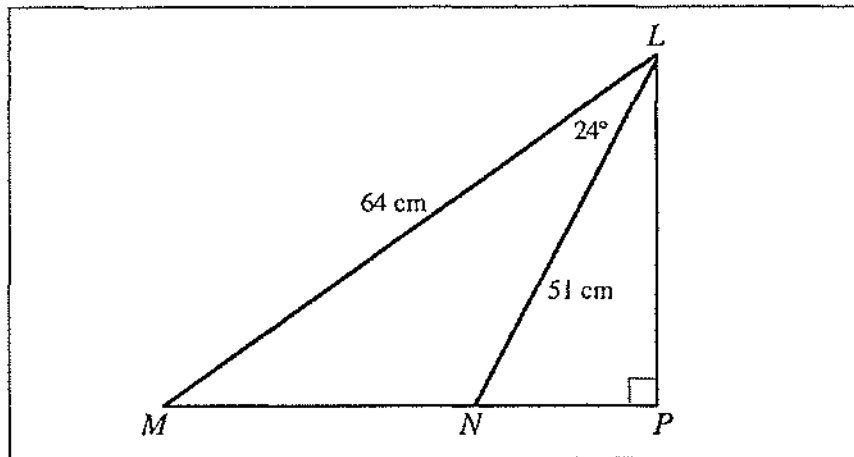
$$d = \sqrt{71606.29} = 267.59..$$

distance = 268 km.

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

2	6	8	
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Use the following diagram to answer the next two questions.



7. The length of  $MN$ , to the nearest tenth of a centimetre, is

- A. 25.8  
 (B) 27.1  
 C. 27.8  
 D. 28.6

$$\begin{aligned} MN^2 &= LM^2 + LN^2 - 2(LM)(LN) \cos L \\ &= (64)^2 + (51)^2 - 2(64)(51) \cos 24^\circ \\ &= 733.375 \\ MN &= \sqrt{733.375} = 27.08.. \end{aligned}$$

8. Which of the following is closest to the measure of angle  $LMN$ ?

- A.  $48^\circ$   
 (B)  $50^\circ$   
 C.  $52^\circ$   
 D.  $54^\circ$

$$\begin{aligned} \cos M &= \frac{(64)^2 + (27.1)^2 - (51)^2}{2(64)(27.1)} = 0.6427 \\ \angle M &= 50.0^\circ \end{aligned}$$

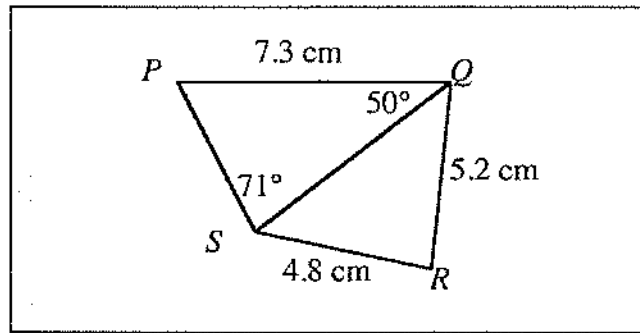
9. Triangle  $LMN$  is obtuse angled at  $M$  and  $\angle MLN = 40^\circ$ .  $\sin LNM$  is equal to

- (A)  $\frac{LM \sin 40^\circ}{MN}$   
 B.  $\frac{LM}{MN \sin 40^\circ}$   
 C.  $\frac{MN}{LM \sin 40^\circ}$   
 D.  $\frac{MN \sin 40^\circ}{LM}$

$$\begin{aligned} \frac{\sin 40^\circ}{MN} &= \frac{\sin LNM}{LM} \\ \sin LNM &= \frac{LM \sin 40^\circ}{MN} \end{aligned}$$



Use the following diagram to answer the next two questions.



- Numerical Response** 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.)

6	.	6	
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$$\angle SPQ = 180^\circ - 71^\circ - 50^\circ = 59^\circ$$

$$\frac{QS}{\sin 59^\circ} = \frac{7.3}{\sin 71^\circ} \quad QS = \frac{7.3 \sin 59^\circ}{\sin 71^\circ} = 6.6$$

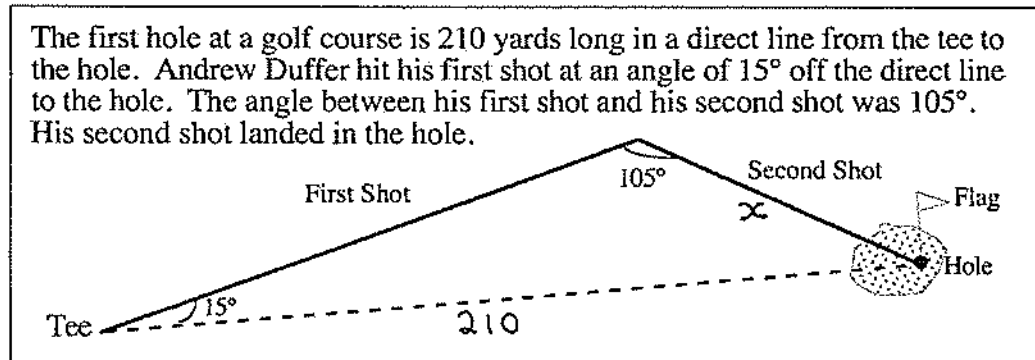
- Numerical Response** 3. The measure of angle  $QSR$ , to the nearest degree, is \_\_\_\_\_.  
(Record your answer in the numerical response box from left to right.)

5	1		
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$$\cos QSR = \frac{(6.6)^2 + (4.8)^2 - (5.2)^2}{2(6.6)(4.8)} = 0.6244$$

$$\angle QSR = 51^\circ$$

Use the following information to answer the next question.

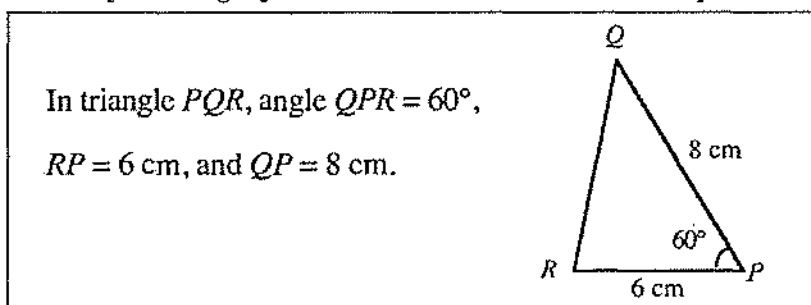


10. The length of his second shot, to the nearest yard, was

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

$$\frac{x}{\sin 15^\circ} = \frac{210}{\sin 105^\circ} \quad x = \frac{210 \sin 15^\circ}{\sin 105^\circ} = 56$$

Use the following information to answer the next two questions.



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

$$QR^2 = 8^2 + 6^2 - 2(8)(6) \cos 60^\circ$$

$$= 52$$

$$QR = \sqrt{52} = 7.2$$

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

$$\frac{\sin Q}{q} = \frac{\sin R}{r}$$

$$\frac{\sin Q}{\sin R} = \frac{q}{r} = \frac{6}{8} = 0.75$$

13. Triangle  $ABC$  is drawn with  $AB = 3.6$  cm,  $BC = 4.2$  cm, and angle  $BCA = 28^\circ$ . The measure of angle  $ABC$  is

A.  $33^\circ$

B.  $119^\circ$

C.  $33^\circ$  or  $147^\circ$

D.  $5^\circ$  or  $119^\circ$

$$c = 3.6 \quad a = 4.2 \quad \angle C = 28^\circ$$

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

$$\sin A = \frac{4.2 \sin 28^\circ}{3.6} = 0.5477$$

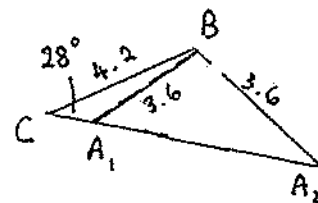
reference angle =  $33^\circ$

Since ref. angle  $>$  given angle  
 there are two solutions

$$\angle A = 33^\circ \text{ or } 180^\circ - 33^\circ = 147^\circ$$

$$\angle B = 180^\circ - 28^\circ - 33^\circ \text{ or } 180^\circ - 28^\circ - 147^\circ$$

$$\angle B = 119^\circ \text{ or } 5^\circ$$

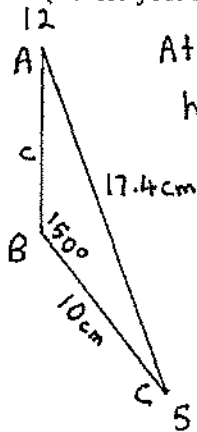


**Numerical Response**

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.)

8	.	0	
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At 5pm, angle between minute hand and hour hand =  $5(30^\circ) = 150^\circ$

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

$$\sin A = \frac{10 \sin 150^\circ}{17.4} = 0.2873$$

$$\angle A = 16.7^\circ$$

$$\angle C = 180^\circ - 150^\circ - 16.7^\circ = 13.3^\circ$$

$$\frac{c}{\sin 13.3^\circ} = \frac{17.4}{\sin 150^\circ}$$

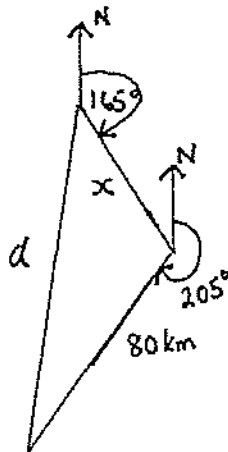
$$c = \frac{17.4 \sin 13.3^\circ}{\sin 150^\circ} = 8.005... = 8.0 \text{ cm}$$

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  $165^\circ$ . He changes direction and flies for 80 km on a bearing of  $205^\circ$ . 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

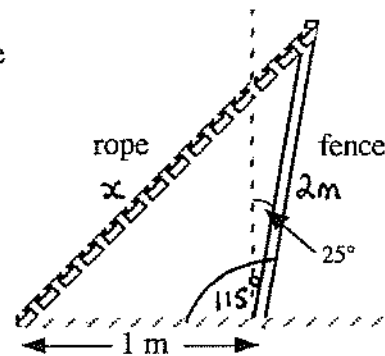


$x$  is unknown

An infinite number of triangles is possible

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**

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

$$= 6.6905$$

$$x = \sqrt{6.6905} = 2.5866$$

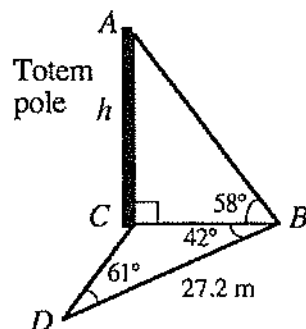
$$2.5866 + 0.5 = 3.0866$$

$$= 3.1 \text{ m}$$

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.



- Numerical Response** 5. 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		
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In  $\triangle BCD$   $\angle C = 180^\circ - 61^\circ - 42^\circ = 77^\circ$

In  $\triangle ABC$   $\tan 58^\circ = \frac{h}{24.415}$

$$\frac{d}{\sin D} = \frac{c}{\sin C}$$

$$\frac{d}{\sin 61^\circ} = \frac{27.2}{\sin 77^\circ}$$

$$d = \frac{27.2 \sin 61^\circ}{\sin 77^\circ} = 24.415..$$

$$h = 24.415 \tan 58^\circ$$

$$h = 39.07$$