

# PRINTABLE VERSION

## Quiz 13

You scored 100 out of 100

### Question 1

Your answer is CORRECT.

A string running from the ground to the top of a fence has an angle of elevation of  $45^\circ$ . The string is 8 feet long. What is the distance between the fence and where the string is pegged to the ground?

a) ☐ 16 ft

b) ☒  $4\sqrt{2}$  ft

c) ☐  $\sqrt{8}$  ft

d) ☐ 4 ft

e) ☐  $4\sqrt{3}$  ft

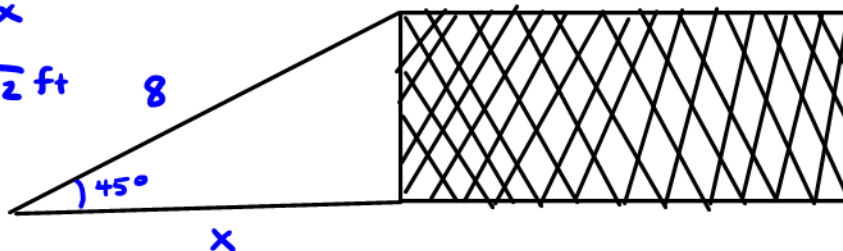
f) ☐ None of the above.

$$\cos 45 = \frac{x}{8}$$

$$\frac{\sqrt{2}}{2} = \frac{x}{8}$$

$$8\sqrt{2} = 2x$$

$$x = 4\sqrt{2} \text{ ft}$$



### Question 2

Your answer is CORRECT.

Suppose that you are headed toward a plateau 40 meters high. If the angle of elevation to the top of the plateau is  $27^\circ$ , how far are you from the base of the plateau?

a) ☐  $40\cos(27^\circ)$

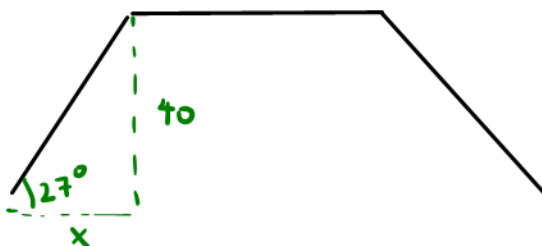
b) ☐  $40\sin(27^\circ)$

c) ☒  $40/\tan(27^\circ)$

d) ☐  $40/\sin(27^\circ)$

e) ☐  $40\tan(27^\circ)$

f) ☐ None of the above.



$$\tan(27) = \frac{40}{x}$$

$$x \tan(27) = 40$$

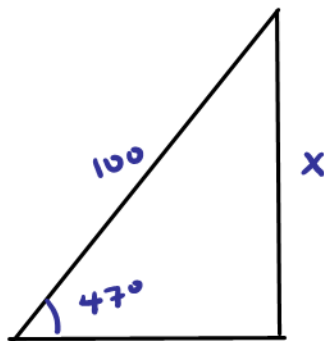
$$x = \frac{40}{\tan(27)}$$

## Question 3

Your answer is CORRECT.

A wire 100 feet long is attached to the top of a radio transmission tower, making an angle of  $47^\circ$  degrees with the ground. How high is the tower? Round your answer to the nearest ten-thousandth.

- a) ☒ 73.1354 ft
- b) ☐ 136.7327 ft
- c) ☐ 80.4489 ft
- d) ☐ 68.1998 ft
- e) ☐ 107.2369 ft
- f) ☐ None of the above.



$$\sin 47 = \frac{X}{100}$$

$$X = 100 \sin 47$$

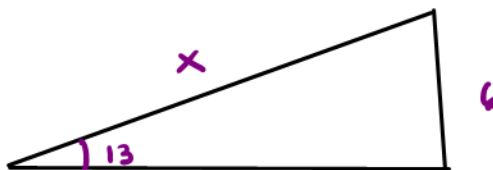
$$X = 73.1354$$

## Question 4

Your answer is CORRECT.

A ramp for wheelchair accessibility is to be constructed with an angle of elevation of  $13^\circ$  degrees and a final height of 6 ft. How long is the ramp?

- a) ☐  $\frac{6}{\tan(13^\circ)}$
- b) ☒  $\frac{6}{\sin(13^\circ)}$
- c) ☐  $6 \sin(13^\circ)$
- d) ☐  $6 \cos(13^\circ)$
- e) ☐  $\frac{6}{\cos(13^\circ)}$
- f) ☐ None of the above.



$$\sin(13) = \frac{6}{X}$$

$$X \sin(13) = 6$$

$$X = \frac{6}{\sin(13)}$$

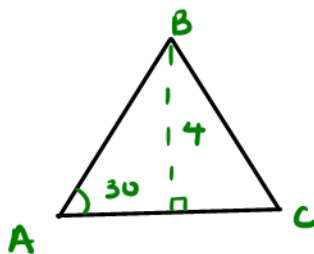
## Question 5

Your answer is CORRECT.

Draw triangle ABC with side BC as the base. The measure of angle A =  $30^\circ$ . If a perpendicular is drawn from B to side AC, the height is 4 cm. What is the length of side AB?

- a) ☐  $4\sqrt{2}$  cm

- b) ☒ 8 cm
- c) ☐  $4\sqrt{3}$  cm
- d) ☐ 2 cm
- e) ☐  $4\sqrt{3}/3$  cm
- f) ☐ None of the above.



$$\sin 30 = \frac{4}{x}$$

$$4 = x \sin 30$$

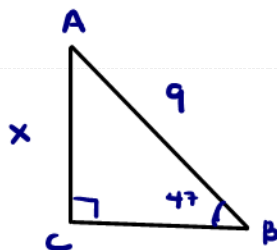
$$4 = x \left( \frac{1}{2} \right)$$

$$8 = x$$

### Question 6

Your answer is CORRECT.

In right triangle ABC with  $m\angle C = 90^\circ$ ,  $m\angle B = 47^\circ$  and AB measures 9 units. Find the length of AC.



$$\sin(47) = \frac{x}{9}$$

$$x = 9 \sin(47)$$

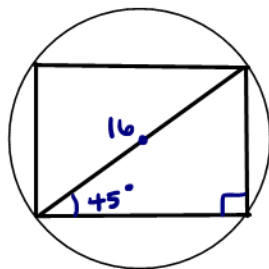
- a) ☐  $\sin(47^\circ)$
- b) ☒  $9\sin(47^\circ)$
- c) ☐  $\frac{9}{2}$
- d) ☐  $9\cos(47^\circ)$
- e) ☐  $9\tan(47^\circ)$
- f) ☐ None of the above.

### Question 7

Your answer is CORRECT.

Find the area of a regular quadrilateral inscribed in a circle of radius 8 cm.

- a) ☒  $128 \text{ cm}^2$
- b) ☐  $96\sqrt{3} \text{ cm}^2$
- c) ☐  $32 \text{ cm}^2$
- d) ☐  $256 \text{ cm}^2$
- e) ☐  $128\sqrt{2} \text{ cm}^2$



$$\begin{matrix} 45 & : & 45 & : & 90 \\ a & & a & & \sqrt{2}a \end{matrix}$$

$$\begin{aligned} \sqrt{2}a &= 16 \\ a &= \frac{16}{\sqrt{2}} = \frac{16\sqrt{2}}{2} \\ &= 8\sqrt{2} \end{aligned}$$

$$A_{\Delta} = \frac{1}{2}ab \sin \theta$$

$$A_{\Delta} = \frac{1}{2}(16)(8\sqrt{2})\left(\frac{\sqrt{2}}{2}\right) = \frac{64 \cdot 2}{2} = 64$$

$$A_{\square} = 2 A_{\Delta} = 2(64) = 128$$

## Question 8

Your answer is CORRECT.

Find the area of an equilateral triangle with side length 10 feet.

a) ☐  $10\sqrt{3} \text{ ft}^2$

b) ☐  $10 \text{ ft}^2$

c) ☒  $25\sqrt{3} \text{ ft}^2$

d) ☐  $50\sqrt{3} \text{ ft}^2$

e) ☐  $20\sqrt{3} \text{ ft}^2$

f) ☐ None of the above.



$$A = \frac{1}{2}(10)(5\sqrt{3})$$

$$A = 25\sqrt{3} \text{ ft}^2$$

$$5^2 + h^2 = 10^2$$

$$h^2 = 100 - 25$$

$$h^2 = 75$$

$$h = 5\sqrt{3}$$

## Question 9

Your answer is CORRECT.

If the area of triangle ABC is 12 square meters, with  $a = 15 \text{ m}$  and  $b = 5 \text{ m}$ , find all possible measures for angle C. Round answers to the nearest hundredth.

a) ☐  $C = 80.79^\circ$  or  $C = 99.21^\circ$

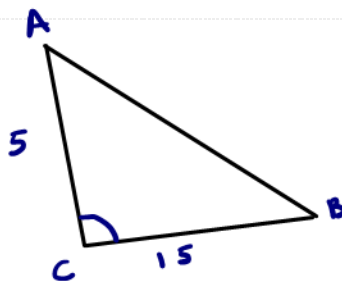
b) ☐  $C = 9.21^\circ$  or  $C = 170.79^\circ$

c) ☐  $C = 3.06^\circ$  or  $C = 176.94^\circ$

d) ☒  $C = 18.66^\circ$  or  $C = 161.34^\circ$

e) ☐  $C = 71.34^\circ$  or  $C = 108.66^\circ$

f) ☐ None of the above.



$$A = 12 \text{ m}^2$$

$$12 = \frac{1}{2}(15)(5)\sin C$$

$$12 = \frac{75}{2}\sin C$$

$$\frac{8}{25} = \sin C$$

$$C = 18.66$$

$$C = 180 - 18.66 = 161.34$$

## Question 10

Your answer is CORRECT.

Find the area of triangle UHV if  $\angle U = 92^\circ$ ,  $\angle V = 28^\circ$ ,  $u = 266 \text{ cm}$  and  $v = 125 \text{ cm}$ . Round your answer to the nearest hundredth.

a) ☐ 28795.34 cm

b) ☐ 8312.50 cm

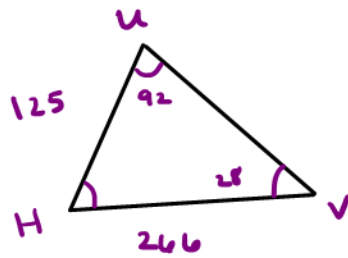
$$4. H = 180 - (92 + 28)$$

$$= 180 - 120$$

$$= 60$$

$$A = \frac{1}{2} (125) (266) \sin 60$$

$$A = 14625 \left( \frac{\sqrt{3}}{2} \right) = 14397.67$$



- c) ☐ 7804.96 cm
- d) ☒ 14397.67 cm
- e) ☐ 16614.87 cm
- f) ☐ None of the above.

### Question 11

Your answer is CORRECT.

To measure the height of a cloud, you place a bright searchlight directly below the cloud and shine the beam straight up. From a point 100 feet away from the searchlight, you measure the angle of elevation of the cloud to be  $74^\circ$ . How high is the cloud? Round your answer to the nearest foot.

- a) ☐ 385 ft
- b) ☐ 384 ft
- c) ☒ 349 ft
- d) ☐ 287 ft
- e) ☐ 363 ft
- f) ☐ None of the above.



$$\tan 74 = \frac{h}{100}$$

$$h = 100 \tan 74$$

$$h = 348.74$$

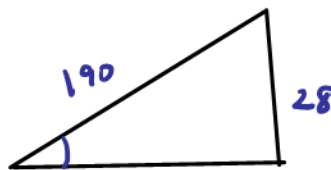
$$h = 349$$

### Question 12

Your answer is CORRECT.

A ramp leading to the freeway overpass is 190 feet long and rises 28 feet. What is the angle of elevation of the ramp to the freeway?

- a) ☐  $13.56^\circ$
- b) ☐  $81.53^\circ$
- c) ☒  $8.47^\circ$
- d) ☐  $0.47^\circ$
- e) ☐  $8.38^\circ$
- f) ☐ None of the above.



$$\sin \theta = \frac{28}{190}$$

$$\theta = \sin^{-1} \left( \frac{28}{190} \right)$$

$$\theta = 8.47$$

## Question 13

Your answer is CORRECT.

Find the area of triangle ABC, where  $\angle C = 90^\circ$ ,  $a = 4$  and  $c = 7$ .

a) ☐  $2\sqrt{65}$

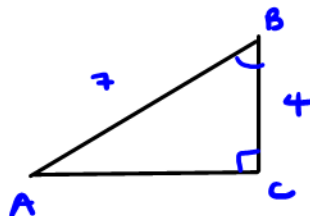
b) ☒  $2\sqrt{33}$

c) ☐  $\frac{11}{2}$

d) ☐  $\frac{65}{2}$

e) ☐ 14

f) ☐ None of the above.



$$4^2 + b^2 = 7^2$$

$$b^2 = 49 - 16$$

$$b^2 = 33$$

$$b = \sqrt{33}$$

$$A = \frac{1}{2} (7)(4) \sin B$$

$$A = \frac{1}{2} (7)(4) \left( \frac{\sqrt{33}}{7} \right)$$

$$A = 2\sqrt{33}$$

## Question 14

Your answer is CORRECT.

Find the area of triangle XYZ if  $\angle Y = 30^\circ$ ,  $z = 7$  and  $x = 6$ .

a) ☐  $21\sqrt{3}$

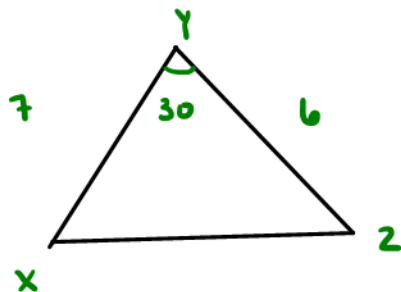
b) ☒  $\frac{21}{2}$

c) ☐ 21

d) ☐  $\frac{21}{2}\sqrt{3}$

e) ☐ 9

f) ☐ None of the above.



$$A = \frac{1}{2} (7)(6) \sin 30$$

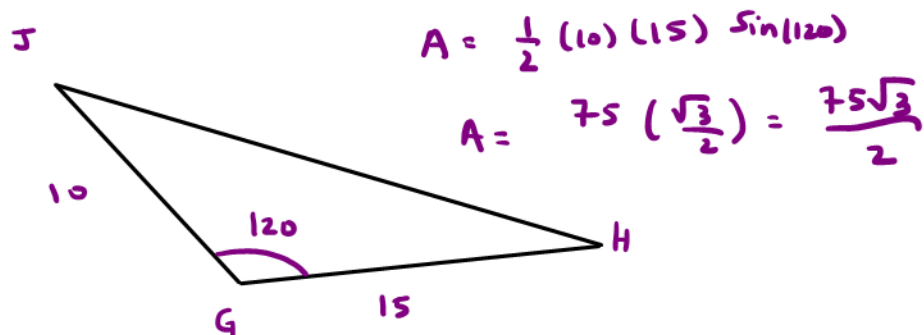
$$A = 21 \left( \frac{1}{2} \right) = \frac{21}{2}$$

## Question 15

Your answer is CORRECT.

Find the area of triangle GHJ if  $\angle G = 120^\circ$ ,  $h = 10$  and  $j = 15$ .

- a) ☐  $\frac{225}{2}$
- b) ☒  $\frac{75}{2}\sqrt{3}$**
- c) ☐  $75\sqrt{3}$
- d) ☐  $\frac{75}{2}$
- e) ☐  $25\sqrt{3}$
- f) ☐ None of the above.



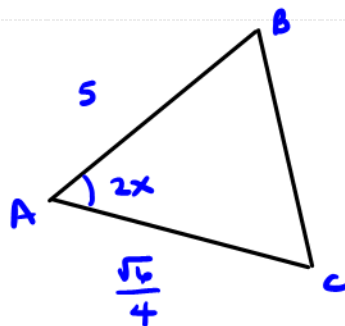
### Question 16

Your answer is CORRECT.

In triangle ABC, the measure of angle A is  $2x$ , the length of AB is 5, and the length of AC is  $\frac{\sqrt{6}}{4}$ . If  $\sin(x) = \frac{1}{5}$ , what is the area of the triangle?

Hint: You will need to use the double angle formula for sine.

- a) ☐  $\frac{\sqrt{2}}{2}$
- b) ☐ 10
- c) ☒  $\frac{3}{5}$**
- d) ☐ 24
- e) ☐ 5
- f) ☐ None of the above.

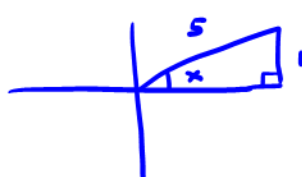


$$A = \frac{1}{2} (5) \left( \frac{\sqrt{6}}{4} \right) \sin 2x$$

$$A = \left( \frac{5}{2} \right) \left( \frac{\sqrt{6}}{4} \right) (2 \sin(x) \cos(x))$$

$$A = \frac{5\sqrt{6}}{8} \left( 2 \left( \frac{1}{5} \right) \left( \frac{2\sqrt{6}}{5} \right) \right)$$

$$A = \frac{20\sqrt{6} \cdot \sqrt{6}}{8 \cdot 5 \cdot 5} = \frac{4 \cdot 8 \cdot 3 \cdot 1}{2 \cdot 4 \cdot 8 \cdot 5}$$



$$a^2 + 1^2 = 5^2$$

$$a^2 = 24$$

$$a = 2\sqrt{6}$$

$$A = \frac{3}{5}$$

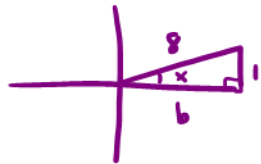
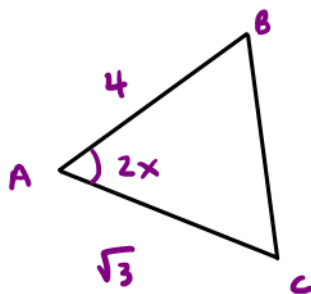
### Question 17

Your answer is CORRECT.

In acute triangle ABC, the measure of angle A is  $2x$ , the length of AB is 4, and the length of AC is  $\sqrt{3}$ . If  $\sin(x) = \frac{1}{8}$ , what is the area of the triangle?

Hint: You will need to use the double angle formula for sine.

- a) ☐  $\frac{1}{4} \sqrt{3}$
- b) ☒  $\frac{3}{16} \sqrt{21}$
- c) ☐  $\frac{3}{32} \sqrt{21}$
- d) ☐  $\frac{1}{2} \sqrt{3}$
- e) ☐  $\frac{1}{32} \sqrt{3}$
- f) ☐ None of the above.



$$b^2 + 1^2 = 8^2$$

$$b^2 = 63$$

$$b = 3\sqrt{7}$$

$$A = \frac{1}{2} bc \sin A$$

$$A = \frac{1}{2} (\sqrt{3})(4) \sin 2x$$

$$A = \frac{1}{2} (4\sqrt{3}) (2 \sin x \cos x)$$

$$A = 4\sqrt{3} \sin x \cos x$$

$$A = 4\sqrt{3} \left(\frac{1}{8}\right) \left(\frac{3\sqrt{7}}{8}\right)$$

$$A = \frac{12\sqrt{21}}{64} = \frac{3\sqrt{21}}{16}$$