

PRINTABLE VERSION

Quiz 14

You scored 100 out of 100

Question 1

Your answer is CORRECT.

Given triangle ABC, the measure of angle A is 60° , the length of BC is $\sqrt{3}$, and the length of AC is $\frac{1}{5}$. How many solutions are there for the measure of angle B?

a) ☐ Cannot be determined.

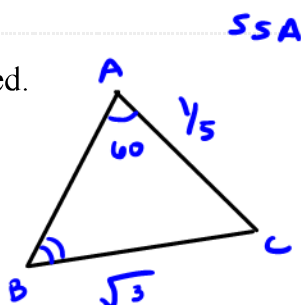
b) ☐ 3

c) ☐ 0

d) ☒ 1

e) ☐ 2

f) ☐ None of the above.



$$\frac{\sin B}{\frac{1}{5}} = \frac{\sin 60}{\sqrt{3}}$$

$$\sqrt{3} \sin B = \frac{\sqrt{3}}{2} \cdot \frac{1}{5}$$

$$\sin B = \frac{\sqrt{3}}{2} \cdot \frac{1}{5} \cdot \frac{1}{\sqrt{3}}$$

$$\sin B = \frac{1}{10}$$

$$B = 5.74^\circ$$

Check

$$60 + 5.74 < 180 \checkmark$$

$$174.26 + 60 < 180 \times$$

$$B = 180 - 5.74 = 174.26$$

Question 2

Your answer is CORRECT.

Given triangle ABC, the measure of angle A is 45° , the length of AB is 6, and the length of AC is 6. What is the length of side BC?

a) ☐ $\sqrt{78 - \sqrt{2}}$

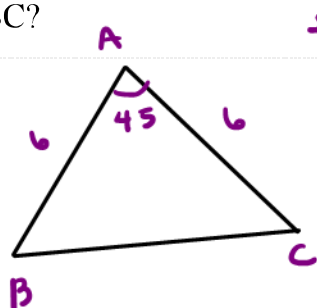
b) ☒ $6\sqrt{2 - \sqrt{2}}$

c) ☐ 42

d) ☐ $6\sqrt{2}$

e) ☐ 3

f) ☐ None of the above.



$$a^2 = 6^2 + 6^2 - 2(6)(6) \cos 45$$

$$a^2 = 36 + 36 - 2(36) \left(\frac{\sqrt{2}}{2}\right)$$

$$a^2 = 72 - 36\sqrt{2}$$

$$a^2 = 36(2 - \sqrt{2})$$

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

Question 3

Your answer is CORRECT.

ABC is a triangle with angle $A = 30^\circ$, angle $B = 135^\circ$, and $BC = 5$ cm. Find AC.

a) ☐ $5\sqrt{6}/2$

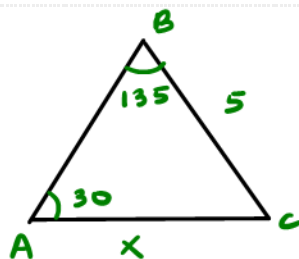
b) ☒ $5\sqrt{2}$

c) ☐ $15/2$

d) ☐ $\sqrt{5}$

e) ☐ 10

f) ☐ None of the above.



SAA

$$\frac{\sin 30}{5} = \frac{\sin 135}{x}$$

$$x \left(\frac{1}{2} \right) = \left(\frac{\sqrt{2}}{2} \right) 5$$

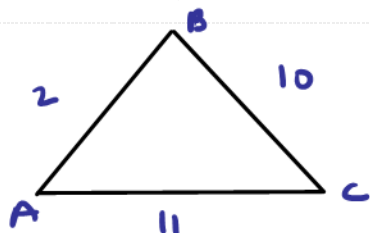
$$x = 5\sqrt{2}$$

Question 4

Your answer is CORRECT.

ABC is a triangle with $AB = 2$, $BC = 10$, and $AC = 11$. Find $\cos(A)$.

Note: You are asked to find the cosine of A, not the measure of angle A. Do not use a calculator.



SSS

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$10^2 = 11^2 + 2^2 - 2(11)(2) \cos A$$

$$100 = 121 + 4 - 44 \cos A$$

$$-25 = -44 \cos A$$

$$\cos A = \frac{25}{44}$$

a) ☒ $25/44$

b) ☐ $11/2$

c) ☐ $25/22$

d) ☐ $217/44$

e) ☐ 5

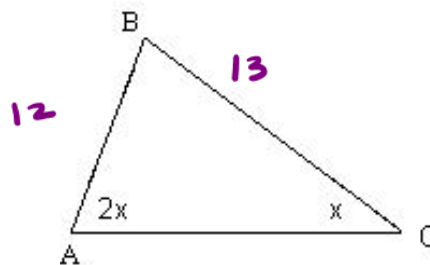
f) ☐ None of the above.

Question 5

Your answer is CORRECT.

Determine the angle x in the triangle given below with $AB = 12$ and $BC = 13$.

Hint: Use the Law of Sines along with a double-angle formula.



$$\frac{\sin x}{12} = \frac{\sin(2x)}{13}$$

$$\frac{\sin x}{12} = \frac{2 \sin(x) \cos(x)}{13}$$

$$13 \sin(x) = 24 \sin(x) \cos(x)$$

$$\frac{13}{24} = \cos(x)$$

$$\cos^{-1}\left(\frac{13}{24}\right) = x$$

a) ☐ $x = \frac{1}{2} \cdot \arccos\left(\frac{13}{24}\right)$

b) ☐ $x = \arccos\left(\frac{13}{12}\right)$

c) ☐ $x = \arcsin\left(\frac{13}{6}\right)$

d) ☐ $x = \frac{1}{2} \cdot \arcsin\left(\frac{12}{13}\right)$

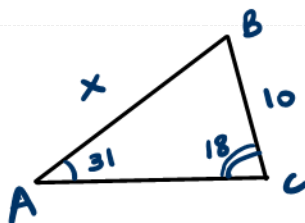
☒ e) $x = \arccos\left(\frac{13}{24}\right)$

f) ☐ None of the above.

Question 6

Your answer is CORRECT.

In triangle ABC, $\angle A$ measures 31° . If $\angle C$ measures 18° and BC has length 10, find AB.



$$\frac{\sin 31}{10} = \frac{\sin 18}{x}$$

$$10 \sin 18 = x \sin 31$$

$$\frac{10 \sin(18)}{\sin(31)} = x$$

a) ☐ 5

b) ☐ $10 \sin\left(\frac{18^\circ}{31^\circ}\right)$

☒ c) $\frac{10 \sin(18^\circ)}{\sin(31^\circ)}$

d) ☐ $5\sqrt{3}$

e) ☐ $\frac{10 \sin(31^\circ)}{\sin(18^\circ)}$

f) ☐ None of the above.

Question 7

Your answer is CORRECT.

An isosceles triangle has a vertex angle measuring 150° . The two equal sides have length Q inches. What is the length of the base (in inches)?

a) ☐ $\sqrt{2Q^2 - Q\sqrt{3}}$

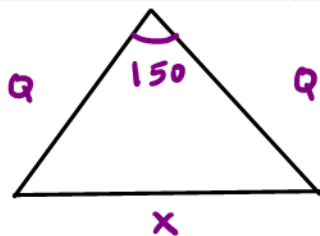
b) ☐ $\sqrt{2Q^2 + 2Q\sqrt{3}}$

c) ☐ $\frac{1}{2}Q\sqrt{8 + 2\sqrt{3}}$

d) ☐ $Q\sqrt{(2 - \sqrt{3})}$

☒ e) $Q\sqrt{(2 + \sqrt{3})}$

f) ☐ None of the above.



$$x^2 = Q^2 + Q^2 - 2QQ \cos 150$$

$$x^2 = 2Q^2 - 2Q^2 \left(-\frac{\sqrt{3}}{2}\right)$$

$$x^2 = 2Q^2 + \sqrt{3}Q^2$$

$$x = \sqrt{Q^2(2 + \sqrt{3})}$$

$$x = Q\sqrt{2 + \sqrt{3}}$$

Question 8

Your answer is CORRECT.

In triangle ABC, the measure of angle A is 60° , the length of BC is $7\sqrt{3}$, and the length of AC is $7\sqrt{2}$. Find all possible measures for angle B.

a) ☐ 60°

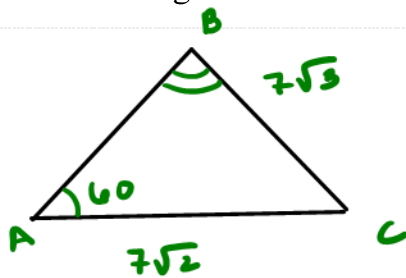
b) ☐ 120°

c) ☐ 45° or 135°

☒ d) 45°

e) ☐ 30° or 150°

f) ☐ None of the above.



$$\frac{\sin 60}{7\sqrt{3}} = \frac{\sin B}{7\sqrt{2}}$$

$$\left(\frac{\sqrt{3}}{2}\right) 7\sqrt{2} = \sin B (7\sqrt{3})$$

$$\sin B = \frac{\sqrt{3}(7\sqrt{2})}{(7\sqrt{3})2}$$

$$\sin B = \frac{\sqrt{2}}{2}$$

$$B = 45$$

$$B = 180 - 45 = 135$$

Check

$$60 + 45 < 180 \checkmark$$

$$135 + 60 < 180 \times$$

Question 9

Your answer is CORRECT.

Two cyclists leave the corner of State Street and Main Street simultaneously. State Street and Main Street are not at right angles; the cyclists' paths have an angle of 120° between them. How far apart are the cyclists after they each travel 5 miles? The answers below are given in miles. Hint: Use the

Law of Cosines

a) ☐ $10 - \sqrt{5}$

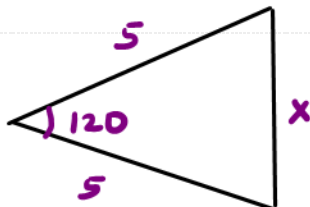
b) ☒ $5\sqrt{3}$

c) ☐ $\sqrt{25 - \sqrt{5}}$

d) ☐ 5

e) ☐ 10

f) ☐ None of the above.



$$x^2 = 5^2 + 5^2 - 2(5)(5) \cos 120$$

$$x^2 = 50 - 50 \left(-\frac{1}{2}\right)$$

$$x^2 = 50 + 25$$

$$x^2 = 75$$

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

Question 10

Your answer is CORRECT.

Given triangle ABC with $AB = 5$ and $BC = 5\sqrt{3}$. The measure of angle A is 120° . How many choices are there for the measure of angle C?

a) ☒ 1

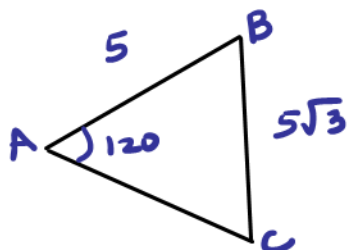
b) ☐ 3

c) ☐ 2

d) ☐ 0

e) ☐ 4

f) ☐ None of the above.



check

$$120 + 30 < 180 \checkmark$$

$$120 + 150 < 180 \times$$

$$\frac{\sin 120}{5\sqrt{3}} = \frac{\sin C}{5}$$

$$5 \sin 120 = 5\sqrt{3} \sin C$$

$$\frac{5 \left(\frac{\sqrt{3}}{2}\right)}{5\sqrt{3}} = \sin C$$

$$\frac{1}{2} = \sin C$$

$$C = 30$$

$$C = 150$$