

Question ID 8d6e840e

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Geometry and Trigonometry	Right triangles and trigonometry	<div><div></div><div></div><div></div></div>

ID: 8d6e840e

A right triangle has legs with lengths of **11** centimeters and **9** centimeters. What is the length of this triangle's hypotenuse, in centimeters?

- A. $\sqrt{40}$
- B. $\sqrt{202}$
- C. 20
- D. 202

ID: 8d6e840e Answer

Correct Answer: B

Rationale

Choice B is correct. The Pythagorean theorem states that for a right triangle, $c^2 = a^2 + b^2$, where c represents the length of the hypotenuse and a and b represent the lengths of the legs. It's given that a right triangle has legs with lengths of 11 centimeters and 9 centimeters. Substituting 11 for a and 9 for b in the formula $c^2 = a^2 + b^2$ yields $c^2 = 11^2 + 9^2$, which is equivalent to $c^2 = 121 + 81$, or $c^2 = 202$. Taking the square root of each side of this equation yields $c = \pm \sqrt{202}$. Since c represents a length, c must be positive. Therefore, the length of the triangle's hypotenuse, in centimeters, is $\sqrt{202}$.

Choice A is incorrect. This is the result of solving the equation $c^2 = 11^2 + 9^2$, not $c^2 = 11^2 + 9^2$.

Choice C is incorrect. This is the result of solving the equation $c^2 = 11^2 + 9^2$, not $c^2 = 11^2 + 9^2$.

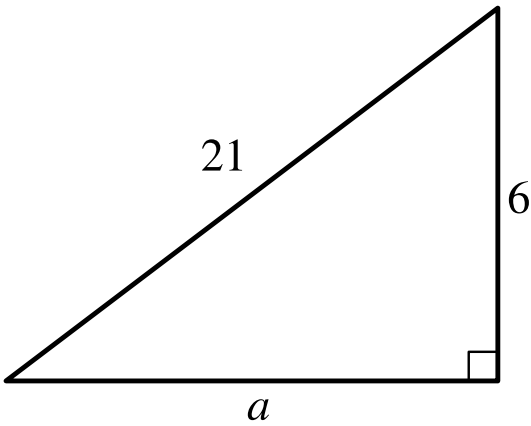
Choice D is incorrect. This is the result of solving the equation $c = 11^2 + 9^2$, not $c^2 = 11^2 + 9^2$.

Question Difficulty: Medium

Question ID 87bce857

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Geometry and Trigonometry	Right triangles and trigonometry	<div><div></div><div></div><div></div></div>

ID: 87bce857



Note: Figure not drawn to scale.

For the triangle shown, which expression represents the value of a ?

- A. $\sqrt{21^2 - 6^2}$
- B. $21^2 - 6^2$
- C. $\sqrt{21 - 6}$
- D. $21 - 6$

ID: 87bce857 Answer

Correct Answer: A

Rationale

Choice A is correct. For the right triangle shown, the lengths of the legs are a units and 6 units, and the length of the hypotenuse is 21 units. The Pythagorean theorem states that in a right triangle, the sum of the squares of the lengths of the two legs is equal to the square of the length of the hypotenuse. Therefore, $a^2 + 6^2 = 21^2$. Subtracting 6^2 from both sides of this equation yields $a^2 = 21^2 - 6^2$. Taking the square root of both sides of this equation yields $a = \pm \sqrt{21^2 - 6^2}$. Since a is a length, a must be positive. Therefore, $a = \sqrt{21^2 - 6^2}$. Thus, for the triangle shown, $\sqrt{21^2 - 6^2}$ represents the value of a .

Choice B is incorrect. For the triangle shown, this expression represents the value of a^2 , not a .

Choice C is incorrect and may result from conceptual errors.

Choice D is incorrect and may result from conceptual errors.

Question Difficulty: Medium

Question ID 02402514

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Geometry and Trigonometry	Right triangles and trigonometry	<div><div></div><div></div><div></div></div>

ID: 02402514

A right triangle has legs with lengths of **28** centimeters and **20** centimeters. What is the length of this triangle's hypotenuse, in centimeters?

- A. $8\sqrt{6}$
- B. $4\sqrt{74}$
- C. 48
- D. 1,184

ID: 02402514 Answer

Correct Answer: B

Rationale

Choice B is correct. The Pythagorean theorem states that in a right triangle, the sum of the squares of the lengths of the two legs is equal to the square of the length of the hypotenuse. It's given that the right triangle has legs with lengths of 28 centimeters and 20 centimeters. Let c represent the length of this triangle's hypotenuse, in centimeters. Therefore, by the Pythagorean theorem, $28^2 + 20^2 = c^2$, or $1,184 = c^2$. Taking the positive square root of both sides of this equation yields $\sqrt{1,184} = c$, or $4\sqrt{74} = c$. Therefore, the length of this triangle's hypotenuse, in centimeters, is $4\sqrt{74}$.

Choice A is incorrect and may result from conceptual or calculation errors.

Choice C is incorrect and may result from conceptual or calculation errors.

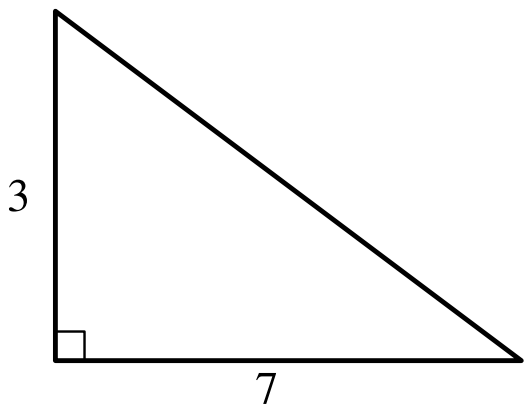
Choice D is incorrect. This is the square of the length of the triangle's hypotenuse.

Question Difficulty: Medium

Question ID b1328025

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Geometry and Trigonometry	Right triangles and trigonometry	<div><div></div><div></div><div></div></div>

ID: b1328025



Note: Figure not drawn to scale.

The lengths of the legs of a right triangle are shown. Which of the following is closest to the length of the triangle's hypotenuse?

- A. 3.2
- B. 5
- C. 7.6
- D. 20

ID: b1328025 Answer

Correct Answer: C

Rationale

Choice C is correct. The Pythagorean theorem states that for a right triangle, $a^2 + b^2 = c^2$, where a and b represent the lengths of the legs of the triangle and c represents the length of its hypotenuse. In the triangle shown, the legs have lengths of 3 and 7. Substituting 3 for a and 7 for b in the equation $a^2 + b^2 = c^2$ yields $3^2 + 7^2 = c^2$, which is equivalent to $9 + 49 = c^2$, or $58 = c^2$. Taking the positive square root of both sides of this equation yields $\sqrt{58} = c$. Thus, the value of c is approximately 7.6. Therefore, of the given choices, 7.6 is the closest to the length of the triangle's hypotenuse.

Choice A is incorrect and may result from conceptual or calculation errors.

Choice B is incorrect and may result from conceptual or calculation errors.

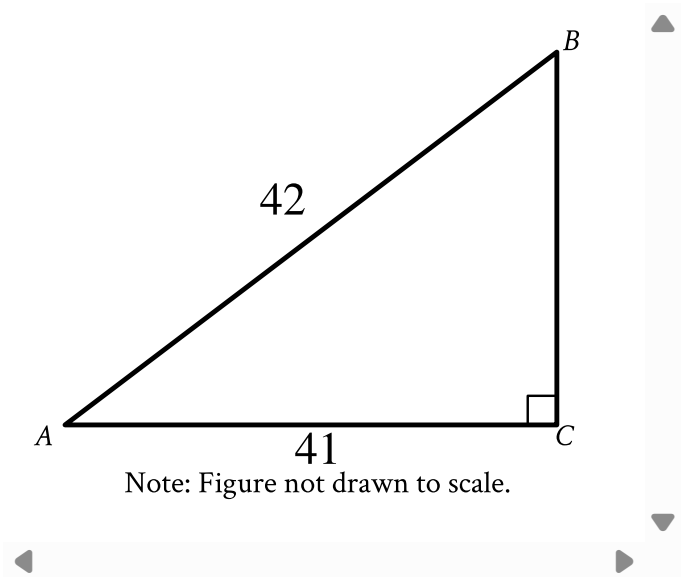
Choice D is incorrect and may result from conceptual or calculation errors.

Question Difficulty: Medium

Question ID a97f2bbe

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Geometry and Trigonometry	Right triangles and trigonometry	<div><div></div><div></div><div></div></div>

ID: a97f2bbe



What is the value of $\cos A$ in the triangle shown?

- A. $\frac{42}{41}$
- B. $\frac{41}{42}$
- C. $\frac{1}{42}$
- D. $\frac{1}{41}$

ID: a97f2bbe Answer

Correct Answer: B

Rationale

Choice B is correct. The cosine of an acute angle in a right triangle is defined as the ratio of the length of the leg adjacent to the angle to the length of the hypotenuse. In the triangle shown, the length of the leg adjacent to angle A is 41, and the length of the hypotenuse is 42. Therefore, $\cos A = \frac{41}{42}$.

Choice A is incorrect. This is the value of $\frac{1}{\cos A}$.

Choice C is incorrect and may result from conceptual or calculation errors.

Choice D is incorrect and may result from conceptual or calculation errors.

Question Difficulty: Medium