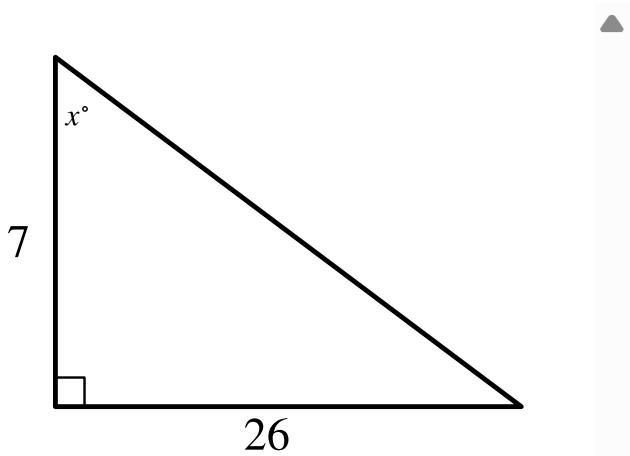


# Question ID 7af120f8

| 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: 7af120f8



Note: Figure not drawn to scale.



In the triangle shown, what is the value of  $\tan x^\circ$ ?

- A.  $\frac{1}{26}$
- B.  $\frac{19}{26}$
- C.  $\frac{26}{7}$
- D.  $\frac{33}{7}$

ID: 7af120f8 Answer

Correct Answer: C

Rationale

Choice C is correct. The tangent of an acute angle in a right triangle is defined as the ratio of the length of the side opposite the angle to the length of the shorter side adjacent to the angle. In the triangle shown, the length of the side opposite the angle with measure  $x^\circ$  is 26 units and the length of the side adjacent to the angle with measure  $x^\circ$  is 7 units. Therefore, the value of  $\tan x^\circ$  is  $\frac{26}{7}$ .

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

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

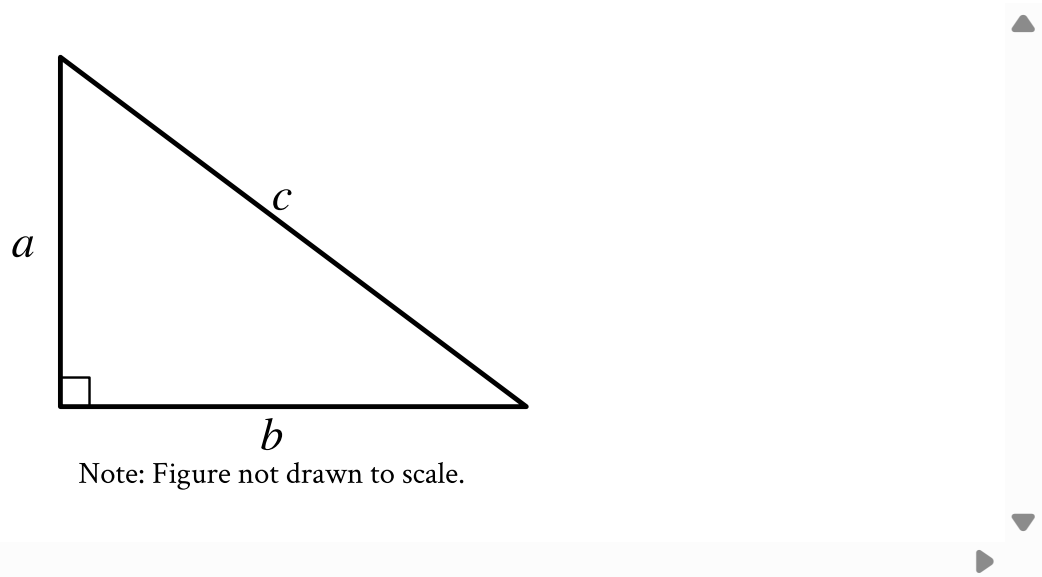
Choice D is incorrect and may result from conceptual or calculation errors.

Question Difficulty: Easy

Question ID 75f5f9f2

| 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: 75f5f9f2



For the right triangle shown,  $a = 4$  and  $b = 5$ . Which expression represents the value of  $c$ ?

- A.  $4 + 5$
- B.  $\sqrt{(4)(5)}$
- C.  $\sqrt{4 + 5}$
- D.  $\sqrt{4^2 + 5^2}$

ID: 75f5f9f2 Answer

Correct Answer: D

Rationale

Choice D is correct. By the Pythagorean theorem, if a right triangle has a hypotenuse with length  $c$  and legs with lengths  $a$  and  $b$ , then  $c^2 = a^2 + b^2$ . In the right triangle shown, the hypotenuse has length  $c$  and the legs have lengths  $a$  and  $b$ . It's given that  $a = 4$  and  $b = 5$ . Substituting 4 for  $a$  and 5 for  $b$  in the Pythagorean theorem yields  $c^2 = 4^2 + 5^2$ . Taking the square root of both sides of this equation yields  $c = \pm \sqrt{4^2 + 5^2}$ . Since the length of a side of a triangle must be positive, the value of  $c$  is  $\sqrt{4^2 + 5^2}$ .

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

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

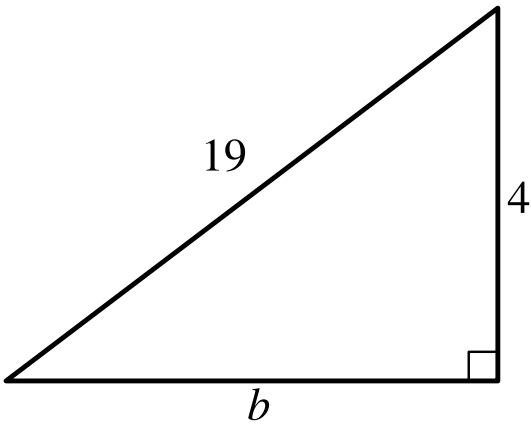
Choice C is incorrect and may result from conceptual or calculation errors.

Question Difficulty: Easy

Question ID 7a589426

| 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: 7a589426



Note: Figure not drawn to scale.

Which equation shows the relationship between the side lengths of the given triangle?

- A.  $4b = 19$
- B.  $4 + b = 19$
- C.  $4^2 + b^2 = 19^2$
- D.  $4^2 - b^2 = 19^2$

ID: 7a589426 Answer

Correct Answer: C

Rationale

Choice C 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. Therefore,  $a^2 + b^2 = c^2$ , where  $a$  and  $b$  are the lengths of the legs and  $c$  is the length of the hypotenuse. For the given right triangle, the lengths of the legs are  $4$  and  $b$ , and the length of the hypotenuse is  $19$ . Substituting  $4$  for  $a$  and  $19$  for  $c$  in the equation  $a^2 + b^2 = c^2$  yields  $4^2 + b^2 = 19^2$ . Thus, the relationship between the side lengths of the given triangle is  $4^2 + b^2 = 19^2$ .

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: Easy