

Question ID 5460398e

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Geometry and Trigonometry	Lines, angles, and triangles	<div><div></div><div></div><div></div></div>

ID: 5460398e

Triangles ABC and DEF are congruent, where A corresponds to D , and B and E are right angles. The measure of angle A is 18° . What is the measure of angle F ?

- A. 18°
- B. 72°
- C. 90°
- D. 162°

ID: 5460398e Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that triangle ABC is congruent to triangle DEF . Corresponding angles of congruent triangles are congruent and, therefore, have equal measure. It's given that angle A corresponds to angle D , and that the measure of angle A is 18° . It's also given that the measures of angles B and E are 90° . Since these angles have equal measure, they are corresponding angles. It follows that angle C corresponds to angle F . Let x° represent the measure of angle C . Since the sum of the measures of the interior angles of a triangle is 180° , it follows that $18^\circ + 90^\circ + x^\circ = 180^\circ$, or $108^\circ + x^\circ = 180^\circ$. Subtracting 108° from both sides of this equation yields $x^\circ = 72^\circ$. Therefore, the measure of angle C is 72° . Since angle C corresponds to angle F , it follows that the measure of angle F is also 72° .

Choice A is incorrect. This is the measure of angle D , not the measure of angle F .

Choice C is incorrect. This is the measure of angle E , not the measure of angle F .

Choice D is incorrect. This is the sum of the measures of angles E and F , not the measure of angle F .

Question Difficulty: Medium

Question ID 8c12e4da

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Geometry and Trigonometry	Lines, angles, and triangles	<div><div></div><div></div><div></div></div>

ID: 8c12e4da

In triangle ABC , the measure of angle B is 52° and the measure of angle C is 17° . What is the measure of angle A ?

- A. 21°
- B. 35°
- C. 69°
- D. 111°

ID: 8c12e4da Answer

Correct Answer: D

Rationale

Choice D is correct. The sum of the angle measures of a triangle is 180° . Adding the measures of angles B and C gives $52 + 17 = 69^\circ$. Therefore, the measure of angle A is $180 - 69 = 111^\circ$.

Choice A is incorrect and may result from subtracting the sum of the measures of angles B and C from 90° , instead of from 180° .

Choice B is incorrect and may result from subtracting the measure of angle C from the measure of angle B .

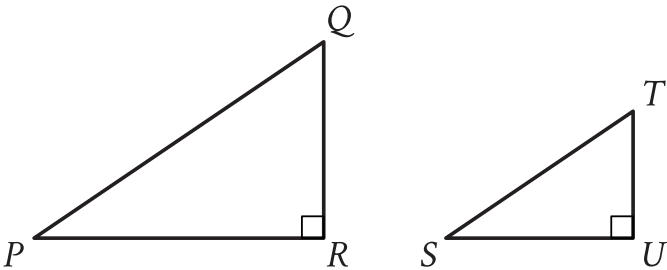
Choice C is incorrect and may result from adding the measures of angles B and C but not subtracting the result from 180° .

Question Difficulty: Medium

Question ID 7a12d469

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Geometry and Trigonometry	Lines, angles, and triangles	<div><div></div><div></div><div></div></div>

ID: 7a12d469



Note: Figures not drawn to scale.

Right triangles PQR and STU are similar, where P corresponds to S . If the measure of angle Q is 18° , what is the measure of angle S ?

- A. 18°
- B. 72°
- C. 82°
- D. 162°

ID: 7a12d469 Answer

Correct Answer: B

Rationale

Choice B is correct. In similar triangles, corresponding angles are congruent. It's given that right triangles PQR and STU are similar, where angle P corresponds to angle S . It follows that angle P is congruent to angle S . In the triangles shown, angle R and angle U are both marked as right angles, so angle R and angle U are corresponding angles. It follows that angle Q and angle T are corresponding angles, and thus, angle Q is congruent to angle T . It's given that the measure of angle Q is 18° , so the measure of angle T is also 18° . Angle U is a right angle, so the measure of angle U is 90° . The sum of the measures of the interior angles of a triangle is 180° . Thus, the sum of the measures of the interior angles of triangle STU is 180 degrees. Let s represent the measure, in degrees, of angle S . It follows that $s + 18 + 90 = 180$, or $s + 108 = 180$. Subtracting 108 from both sides of this equation yields $s = 72$. Therefore, if the measure of angle Q is 18 degrees, then the measure of angle S is 72 degrees.

Choice A is incorrect. This is the measure of angle T .

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

Choice D is incorrect. This is the sum of the measures of angle S and angle U .

Question Difficulty: Medium

Question ID ad5516fd

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Geometry and Trigonometry	Lines, angles, and triangles	<div><div></div><div></div><div></div></div>

ID: ad5516fd

In $\triangle RST$, the measure of $\angle R$ is 63° . Which of the following could be the measure, in degrees, of $\angle S$?

- A. 116
- B. 118
- C. 126
- D. 180

ID: ad5516fd Answer

Correct Answer: A

Rationale

Choice A is correct. The sum of the measures of the angles of a triangle is 180° . Therefore, the sum of the measures of $\angle R$, $\angle S$, and $\angle T$ is 180° . It's given that the measure of $\angle R$ is 63° . It follows that the sum of the measures of $\angle S$ and $\angle T$ is $180 - 63^\circ$, or 117° . Therefore, the measure of $\angle S$, in degrees, must be less than 117. Of the given choices, only 116 is less than 117. Thus, the measure, in degrees, of $\angle S$ could be 116.

Choice B is incorrect. If the measure of $\angle S$ is 118° , then the sum of the measures of the angles of the triangle is greater than, not equal to, 180° .

Choice C is incorrect. If the measure of $\angle S$ is 126° , then the sum of the measures of the angles of the triangle is greater than, not equal to, 180° .

Choice D is incorrect. This is the sum of the measures of the angles of a triangle, in degrees.

Question Difficulty: Medium

Question ID fcf5cbea

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Geometry and Trigonometry	Lines, angles, and triangles	<div><div></div><div></div><div></div></div>

ID: fcf5cbea

In triangle JKL , the measures of $\angle K$ and $\angle L$ are each 48° . What is the measure of $\angle J$, in degrees? (Disregard the degree symbol when entering your answer.)

ID: fcf5cbea Answer

Correct Answer: 84

Rationale

The correct answer is 84. The sum of the measures of the interior angles of a triangle is 180° . It's given that in triangle JKL , the measures of $\angle K$ and $\angle L$ are each 48° . Adding the measures, in degrees, of $\angle K$ and $\angle L$ gives $48 + 48$, or 96. Therefore, the measure of $\angle J$, in degrees, is $180 - 96$, or 84.

Question Difficulty: Medium

Question ID 51a28608

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Geometry and Trigonometry	Lines, angles, and triangles	<div><div></div><div></div><div></div></div>

ID: 51a28608

Right triangles LMN and PQR are similar, where L and M correspond to P and Q , respectively. Angle M has a measure of 53° . What is the measure of angle Q ?

- A. 37°
- B. 53°
- C. 127°
- D. 143°

ID: 51a28608 Answer

Correct Answer: B

Rationale

Choice B is correct. It’s given that triangle LMN is similar to triangle PQR . Corresponding angles of similar triangles are congruent. Since angle M and angle Q correspond to each other, they must be congruent. Therefore, if the measure of angle M is 53° , then the measure of angle Q is also 53° .

Choice A is incorrect and may result from concluding that angle M and angle Q are complementary rather than congruent.

Choice C is incorrect and may result from concluding that angle M and angle Q are supplementary rather than congruent.

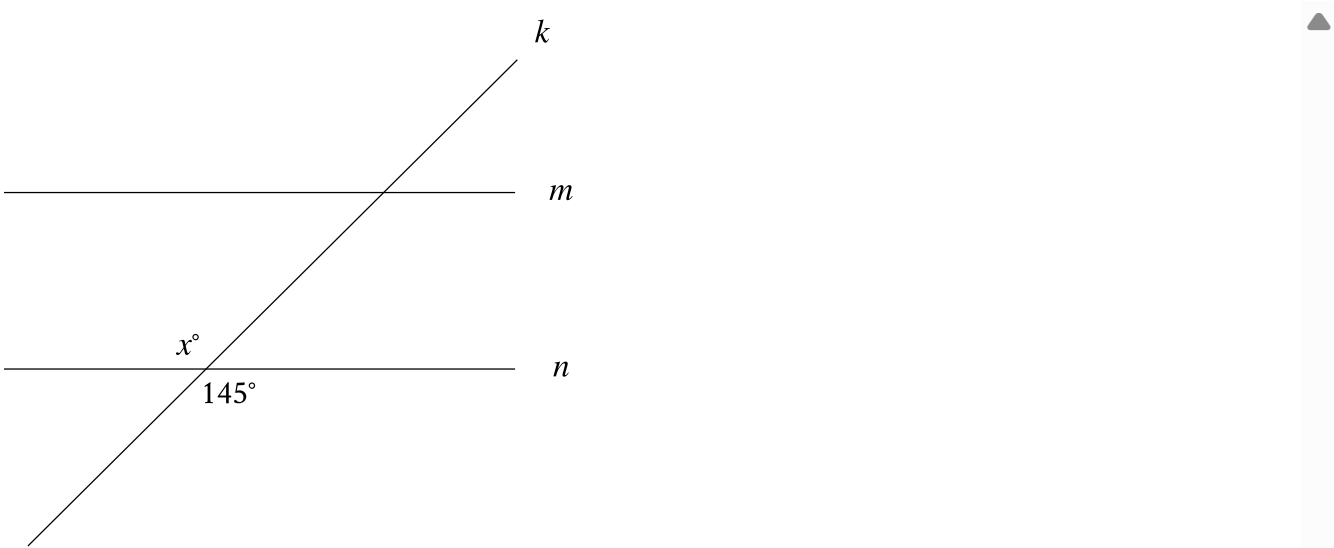
Choice D is incorrect and may result from conceptual or calculation errors.

Question Difficulty: Medium

Question ID 9aa57971

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Geometry and Trigonometry	Lines, angles, and triangles	<div><div></div><div></div><div></div></div>

ID: 9aa57971



Note: Figure not drawn to scale.



In the figure, line *m* is parallel to line *n*, and line *k* intersects both lines. Which of the following statements is true?

- A. The value of *x* is less than 145.
- B. The value of *x* is greater than 145.
- C. The value of *x* is equal to 145.
- D. The value of *x* cannot be determined.

ID: 9aa57971 Answer

Correct Answer: C

Rationale

Choice C is correct. Vertical angles, or angles that are opposite each other when two lines intersect, are congruent. It's given that line *k* intersects line *n*. Based on the figure, the angle with measure *x*° and the angle with measure 145° are vertical angles. Therefore, the value of *x* is equal to 145.

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 cdd40566

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Geometry and Trigonometry	Lines, angles, and triangles	<div><div></div><div></div><div></div></div>

ID: cdd40566

Triangle ABC is similar to triangle XYZ , such that A , B , and C correspond to X , Y , and Z respectively. The length of each side of triangle XYZ is 2 times the length of its corresponding side in triangle ABC . The measure of side AB is 16. What is the measure of side XY ?

- A. 14
- B. 16
- C. 18
- D. 32

ID: cdd40566 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that triangle ABC is similar to triangle XYZ , such that A , B , and C correspond to X , Y , and Z , respectively. Therefore, side AB corresponds to side XY . Since the length of each side of triangle XYZ is 2 times the length of its corresponding side in triangle ABC , it follows that the measure of side XY is 2 times the measure of side AB . Thus, since the measure of side AB is 16, then the measure of side XY is 216, or 32.

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

Choice B is incorrect. This is the measure of side AB , not side XY .

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

Question Difficulty: Medium

Question ID 60c17d6e

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Geometry and Trigonometry	Lines, angles, and triangles	<div><div></div><div></div><div></div></div>

ID: 60c17d6e

Two nearby trees are perpendicular to the ground, which is flat. One of these trees is **10** feet tall and has a shadow that is **5** feet long. At the same time, the shadow of the other tree is **2** feet long. How tall, in feet, is the other tree?

- A. **3**
- B. **4**
- C. **8**
- D. **27**

ID: 60c17d6e Answer

Correct Answer: B

Rationale

Choice B is correct. Each tree and its shadow can be modeled using a right triangle, where the height of the tree and the length of its shadow are the legs of the triangle. At a given point in time, the right triangles formed by two nearby trees and their respective shadows will be similar. Therefore, if the height of the other tree is x , in feet, the value of x can be calculated by solving the proportional relationship $\frac{10 \text{ feet tall}}{5 \text{ feet long}} = \frac{x \text{ feet tall}}{2 \text{ feet long}}$. This equation is equivalent to $\frac{10}{5} = \frac{x}{2}$, or $2 = \frac{x}{2}$. Multiplying each side of the equation $2 = \frac{x}{2}$ by 2 yields $4 = x$. Therefore, the other tree is 4 feet tall.

Choice A is incorrect and may result from calculating the difference between the lengths of the shadows, rather than the height of the other tree.

Choice C is incorrect and may result from calculating the difference between the height of the 10-foot-tall tree and the length of the shadow of the other tree, rather than calculating the height of the other tree.

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

Question Difficulty: Medium

Question ID a3df7802

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Geometry and Trigonometry	Lines, angles, and triangles	<div><div></div><div></div><div></div></div>

ID: a3df7802

In triangle ABC , $AB = 4,680$ millimeters (mm) and $BC = 4,680$ mm . Which statement is sufficient to prove that triangle ABC is equilateral?

- A. $AC = 4,680$ mm
- B. $AC = 468$ mm
- C. $AC = 46.8$ mm
- D. $AC = 4.68$ mm

ID: a3df7802 Answer

Correct Answer: A

Rationale

Choice A is correct. In an equilateral triangle, all three sides have the same length. It’s given that in triangle ABC , $AB = 4,680$ mm and $BC = 4,680$ mm . Therefore, if $AC = 4,680$ mm , then all three sides of triangle ABC have the same length, so triangle ABC is equilateral. Therefore, $AC = 4,680$ mm is sufficient to prove that triangle ABC is equilateral.

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

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

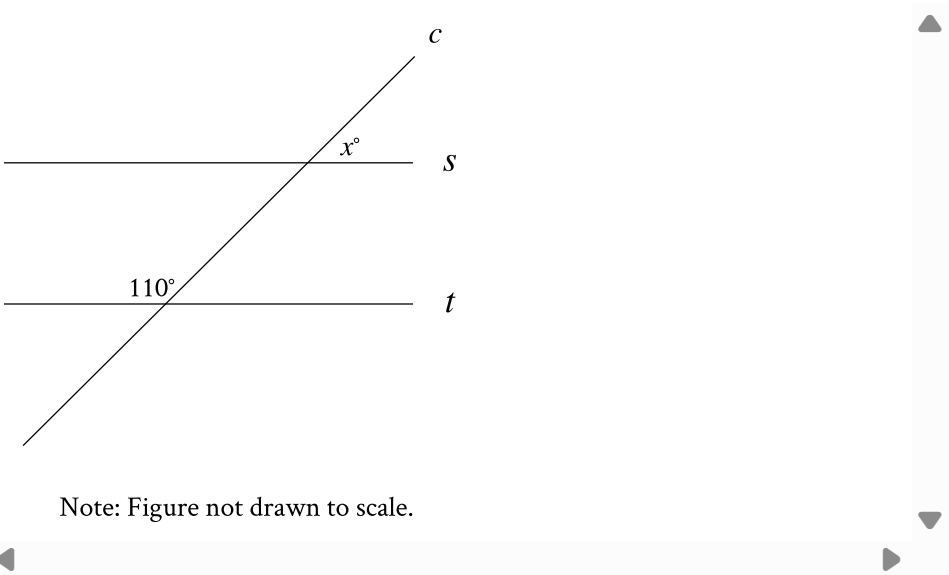
Choice D is incorrect and may result from conceptual or calculation errors.

Question Difficulty: Medium

Question ID c3cae165

Assessment	Test	Domain	Skill	Difficulty
PSAT/NMSQT & PSAT 10	Math	Geometry and Trigonometry	Lines, angles, and triangles	<div><div></div><div></div><div></div></div>

ID: c3cae165



In the figure shown, line c intersects parallel lines s and t . What is the value of x ?

ID: c3cae165 Answer

Correct Answer: 70

Rationale

The correct answer is 70. Based on the figure, the angle with measure 110° and the angle vertical to the angle with measure x° are same side interior angles. Since vertical angles are congruent, the angle vertical to the angle with measure x° also has measure x° . It's given that lines s and t are parallel. Therefore, same side interior angles between lines s and t are supplementary. It follows that $x + 110 = 180$. Subtracting 110 from both sides of this equation yields $x = 70$.

Question Difficulty: Medium