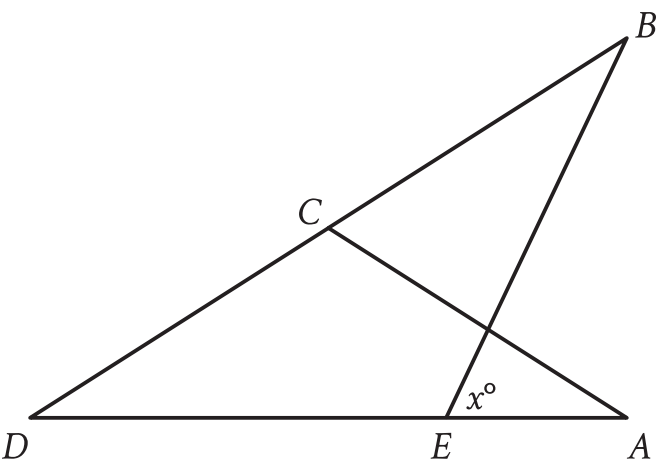


Question ID 6d99b141

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Geometry and Trigonometry	Lines, angles, and triangles	■ ■ ■

ID: 6d99b141



Note: Figure not drawn to scale.

In the figure, $AC = CD$. The measure of angle EBC is 45° , and the measure of angle ACD is 104° . What is the value of x ?

ID: 6d99b141 Answer

Correct Answer: 83

Rationale

The correct answer is 83. It's given that in the figure, $AC = CD$. Thus, triangle ACD is an isosceles triangle and the measure of angle CDA is equal to the measure of angle CAD . 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 ACD is 180° . It's given that the measure of angle ACD is 104° . It follows that the sum of the measures of angles CDA and CAD is $180 - 104^\circ$, or 76° . Since the measure of angle CDA is equal to the measure of angle CAD , the measure of angle CDA is half of 76° , or 38° . The sum of the measures of the interior angles of triangle BDE is 180° . It's given that the measure of angle EBC is 45° . Since the measure of angle BDE , which is the same angle as angle CDA , is 38° , it follows that the measure of angle DEB is $180 - 45 - 38^\circ$, or 97° . Since angle DEB and angle AEB form a straight line, the sum of the measures of these angles is 180° . It's given in the figure that the measure of angle AEB is x° . It follows that $97 + x = 180$. Subtracting 97 from both sides of this equation yields $x = 83$.

Question Difficulty: Hard

Question ID 9912e19f

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Geometry and Trigonometry	Lines, angles, and triangles	<div><div></div><div></div><div></div></div>

ID: 9912e19f

Triangles EFG and JKL are congruent, where E , F , and G correspond to J , K , and L , respectively. The measure of angle E is 45° and the measure of angle F is 20° . What is the measure of angle J ?

- A. 20°
- B. 45°
- C. 135°
- D. 160°

ID: 9912e19f Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that triangles EFG and JKL are congruent such that angle E corresponds to angle J . Corresponding angles of congruent triangles are congruent, so angle E and angle J must be congruent. Therefore, if the measure of angle E is 45° , then the measure of angle J is also 45° .

Choice A is incorrect. This is the measure of angle K , not angle J .

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: Easy

Question ID 4b7bb316

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Geometry and Trigonometry	Area and volume	<div><div></div><div></div><div></div></div>

ID: 4b7bb316

The length of each edge of a box is **29** inches. Each side of the box is in the shape of a square. The box does not have a lid. What is the exterior surface area, in square inches, of this box without a lid?

ID: 4b7bb316 Answer

Correct Answer: 4205

Rationale

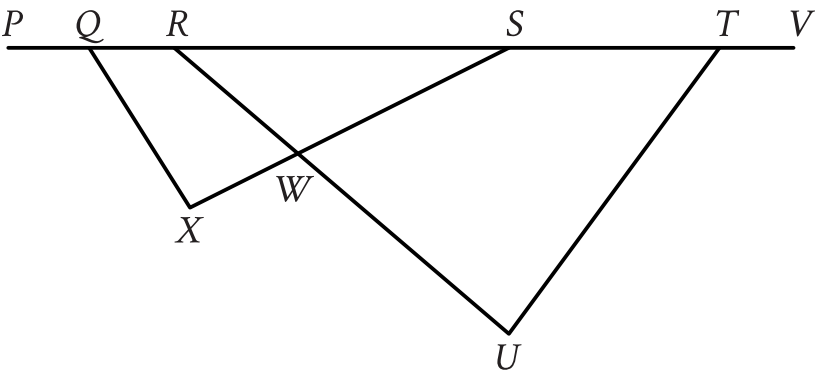
The correct answer is 4,205. The exterior surface area of a figure is the sum of the areas of all its faces. It's given that the box does not have a lid and that each side of the box is in the shape of a square. Therefore, the box consists of 5 congruent square faces. It's also given that the length of each edge is 29 inches. Let s represent the length of an edge of a square. It follows that the area of a square is equal to s^2 . Therefore, the area of each of the 5 square faces is equal to 29^2 , or 841, square inches. Since the box consists of 5 congruent square faces, it follows that the sum of the areas of all its faces, or the exterior surface area of this box without a lid, is 5841, or 4,205, square inches.

Question Difficulty: Medium

Question ID e10d8313

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Geometry and Trigonometry	Lines, angles, and triangles	■ ■ ■

ID: e10d8313



Note: Figure not drawn to scale.

In the figure shown, points Q , R , S , and T lie on line segment PV , and line segment RU intersects line segment SX at point W . The measure of $\angle SQX$ is 48° , the measure of $\angle SXQ$ is 86° , the measure of $\angle SWU$ is 85° , and the measure of $\angle VTU$ is 162° . What is the measure, in degrees, of $\angle TUR$?

ID: e10d8313 Answer

Correct Answer: 123

Rationale

The correct answer is 123. The triangle angle sum theorem states that the sum of the measures of the interior angles of a triangle is 180 degrees. It's given that the measure of $\angle SQX$ is 48° and the measure of $\angle SXQ$ is 86° . Since points S , Q , and X form a triangle, it follows from the triangle angle sum theorem that the measure, in degrees, of $\angle QSX$ is $180 - 48 - 86$, or 46. It's also given that the measure of $\angle SWU$ is 85° . Since $\angle SWU$ and $\angle SWR$ are supplementary angles, the sum of their measures is 180 degrees. It follows that the measure, in degrees, of $\angle SWR$ is $180 - 85$, or 95. Since points R , S , and W form a triangle, and $\angle RSW$ is the same angle as $\angle QSX$, it follows from the triangle angle sum theorem that the measure, in degrees, of $\angle WRS$ is $180 - 46 - 95$, or 39. It's given that the measure of $\angle VTU$ is 162° . Since $\angle VTU$ and $\angle STU$ are supplementary angles, the sum of their measures is 180 degrees. It follows that the measure, in degrees, of $\angle STU$ is $180 - 162$, or 18. Since points R , T , and U form a triangle, and $\angle URT$ is the same angle as $\angle WRS$, it follows from the triangle angle sum theorem that the measure, in degrees, of $\angle TUR$ is $180 - 39 - 18$, or 123.

Question Difficulty: Hard

Question ID bcb66188

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Geometry and Trigonometry	Right triangles and trigonometry	<div><div></div><div></div><div></div></div>

ID: bcb66188

Triangle FGH is similar to triangle JKL , where angle F corresponds to angle J and angles G and K are right angles. If $\sin(F) = \frac{308}{317}$, what is the value of $\sin(J)$?

- A. $\frac{75}{317}$
- B. $\frac{308}{317}$
- C. $\frac{317}{308}$
- D. $\frac{317}{75}$

ID: bcb66188 Answer

Correct Answer: B

Rationale

Choice B is correct. If two triangles are similar, then their corresponding angles are congruent. It's given that right triangle FGH is similar to right triangle JKL and angle F corresponds to angle J . It follows that angle F is congruent to angle J and, therefore, the measure of angle F is equal to the measure of angle J . The sine ratios of angles of equal measure are equal. Since the measure of angle F is equal to the measure of angle J , $\sin F = \sin J$. It's given that $\sin F = \frac{308}{317}$. Therefore, $\sin J$ is $\frac{308}{317}$.

Choice A is incorrect. This is the value of $\cos J$, not the value of $\sin J$.

Choice C is incorrect. This is the reciprocal of the value of $\sin J$, not the value of $\sin J$.

Choice D is incorrect. This is the reciprocal of the value of $\cos J$, not the value of $\sin J$.

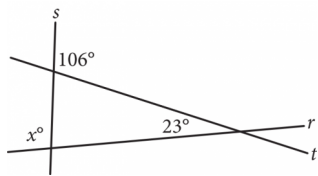
Question Difficulty: Medium

Question ID f88f27e5

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Geometry and Trigonometry	Lines, angles, and triangles	■ ■ ■

ID: f88f27e5

Intersecting lines r , s , and t are shown below.



What is the value of x ?

ID: f88f27e5 Answer

Rationale

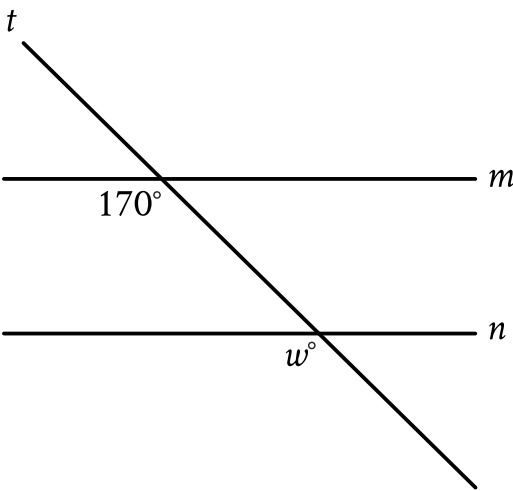
The correct answer is 97. The intersecting lines form a triangle, and the angle with measure of x° is an exterior angle of this triangle. The measure of an exterior angle of a triangle is equal to the sum of the measures of the two nonadjacent interior angles of the triangle. One of these angles has measure of 23° and the other, which is supplementary to the angle with measure 106° , has measure of $180^\circ - 106^\circ = 74^\circ$. Therefore, the value of x is $23 + 74 = 97$.

Question Difficulty: Hard

Question ID 5207e508

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Geometry and Trigonometry	Lines, angles, and triangles	<div><div></div><div></div><div></div></div>

ID: 5207e508



Note: Figure not drawn to scale.
In the figure, line m is parallel to line n . What is the value of w ?

- A. 17
- B. 30
- C. 70
- D. 170

ID: 5207e508 Answer

Correct Answer: D

Rationale

Choice D is correct. It's given that lines m and n are parallel. Since line t intersects both lines m and n , it's a transversal. The angles in the figure marked as 170° and w° are on the same side of the transversal, where one is an interior angle with line m as a side, and the other is an exterior angle with line n as a side. Thus, the marked angles are corresponding angles. When two parallel lines are intersected by a transversal, corresponding angles are congruent and, therefore, have equal measure. It follows that $w^\circ = 170^\circ$. Therefore, the value of w is 170.

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 f67e4efc

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Geometry and Trigonometry	Area and volume	<div><div></div><div></div><div></div></div>

ID: f67e4efc

A right circular cylinder has a volume of 45π . If the height of the cylinder is 5, what is the radius of the cylinder?

- A. 3
- B. 4.5
- C. 9
- D. 40

ID: f67e4efc Answer

Correct Answer: A

Rationale

Choice A is correct. The volume of a right circular cylinder with a radius of r is the product of the area of the base, πr^2 , and the height, h . The volume of the right circular cylinder described is 45π and its height is 5. If the radius is r , it follows that $45\pi = \pi(r)^2(5)$. Dividing both sides of this equation by 5π yields $9 = r^2$. Taking the square root of both sides yields $r = 3$ or $r = -3$. Since r represents the radius, the value must be positive. Therefore, the radius is 3.

Choice B is incorrect and may result from finding that the square of the radius is 9, but then from dividing 9 by 2, rather than taking the square root of 9. Choice C is incorrect. This represents the square of the radius. Choice D is incorrect and may result from solving the equation $45\pi = \pi(r)^2(5)$ for r^2 , not r , by dividing by π on both sides and then by subtracting, not dividing, 5 from both sides.

Question Difficulty: Medium

Question ID e5c57163

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Geometry and Trigonometry	Area and volume	<div><div></div><div></div><div></div></div>

ID: e5c57163

Square A has side lengths that are **166** times the side lengths of square B. The area of square A is ***k*** times the area of square B. What is the value of ***k***?

ID: e5c57163 Answer

Correct Answer: 27556

Rationale

The correct answer is 27,556. The area of a square is s^2 , where s is the side length of the square. Let x represent the length of each side of square B. Substituting x for s in s^2 yields x^2 . It follows that the area of square B is x^2 . It's given that square A has side lengths that are 166 times the side lengths of square B. Since x represents the length of each side of square B, the length of each side of square A can be represented by the expression $166x$. It follows that the area of square A is $166x^2$, or $27,556x^2$. It's given that the area of square A is k times the area of square B. Since the area of square A is equal to $27,556x^2$, and the area of square B is equal to x^2 , an equation representing the given statement is $27,556x^2 = kx^2$. Since x represents the length of each side of square B, the value of x must be positive. Therefore, the value of x^2 is also positive, so it does not equal 0. Dividing by x^2 on both sides of the equation $27,556x^2 = kx^2$ yields $27,556 = k$. Therefore, the value of k is 27,556.

Question Difficulty: Hard