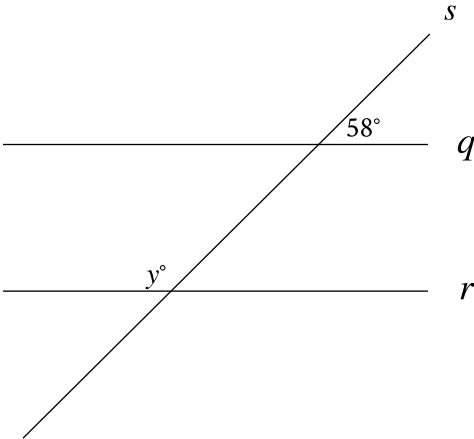


Question ID 686b5212

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

ID: 686b5212



Note: Figure not drawn to scale.

In the figure, line q is parallel to line r , and both lines are intersected by line s . If $y = 2x + 8$, what is the value of x ?

ID: 686b5212 Answer

Correct Answer: 57

Rationale

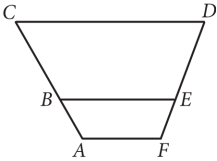
The correct answer is 57. Based on the figure, the angle with measure y° and the angle vertical to the angle with measure 58° are same side interior angles. Since vertical angles are congruent, the angle vertical to the angle with measure 58° also has measure 58° . It's given that lines q and r are parallel. Therefore, same side interior angles between lines q and r are supplementary. It follows that $y + 58 = 180$. If $y = 2x + 8$, then the value of x can be found by substituting $2x + 8$ for y in the equation $y + 58 = 180$, which yields $2x + 8 + 58 = 180$, or $2x + 66 = 180$. Subtracting 66 from both sides of this equation yields $2x = 114$. Dividing both sides of this equation by 2 yields $x = 57$. Thus, if $y = 2x + 8$, the value of x is 57.

Question Difficulty: Medium

Question ID 81b664bc

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

ID: 81b664bc



In the figure above, \overline{AF} , \overline{BE} , and \overline{CD} are parallel. Points B and E lie on \overline{AC} and \overline{FD} , respectively. If $AB = 9$, $BC = 18.5$, and $FE = 8.5$, what is the length of \overline{ED} , to the nearest tenth?

- A. 16.8
- B. 17.5
- C. 18.4
- D. 19.6

ID: 81b664bc Answer

Correct Answer: B

Rationale

Choice B is correct. Since \overline{AF} , \overline{BE} , and \overline{CD} are parallel, quadrilaterals $AFEB$ and $BEDC$ are similar. Let x represent the length of \overline{ED} . With similar figures, the ratios of the lengths of corresponding sides are equal. It follows that $\frac{9}{18.5} = \frac{8.5}{x}$. Multiplying both sides of this equation by 18.5 and by x yields $9x = (18.5)(8.5)$, or $9x = 157.25$. Dividing both sides of this equation by 9 yields $x = 17.47$, which to the nearest tenth is 17.5.

Choices A, C, and D are incorrect and may result from errors made when setting up the proportion.

Question Difficulty: Medium

Question ID 94364a79

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

ID: 94364a79

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: 94364a79 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.

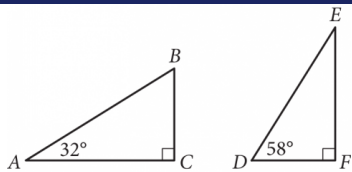
Choice D is incorrect and may result from a conceptual or calculation error.

Question Difficulty: Medium

Question ID 933fee1a

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

ID: 933fee1a



Triangles ABC and DEF are shown above. Which of the

following is equal to the ratio $\frac{BC}{AB}$?

A. $\frac{DE}{DF}$

B. $\frac{DF}{DE}$

C. $\frac{DF}{EF}$

D. $\frac{EF}{DE}$

ID: 933fee1a Answer

Correct Answer: B

Rationale

Choice B is correct. In right triangle ABC , the measure of angle B must be 58° because the sum of the measure of angle A , which is 32° , and the measure of angle B is 90° . Angle D in the right triangle DEF has measure 58° . Hence, triangles ABC and DEF are similar (by angle-angle similarity). Since \overline{BC} is the side opposite to the angle with measure 32° and AB is the hypotenuse in right triangle ABC , the ratio $\frac{BC}{AB}$ is equal to $\frac{DF}{DE}$.

Alternate approach: The trigonometric ratios can be used to answer this question. In right triangle ABC , the ratio $\frac{BC}{AB} = \sin(32^\circ)$. The angle E in triangle DEF has measure 32° because $m(\angle D) + m(\angle E) = 90^\circ$. In triangle DEF , the ratio $\frac{DF}{DE} = \sin(32^\circ)$. Therefore, $\frac{DF}{DE} = \frac{BC}{AB}$.

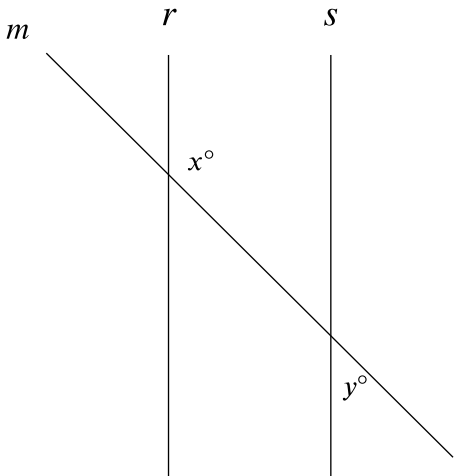
Choice A is incorrect because $\frac{DE}{DF}$ is the reciprocal of the ratio $\frac{BC}{AB}$. Choice C is incorrect because $\frac{DF}{EF} = \frac{BC}{AC}$, not $\frac{BC}{AB}$. Choice D is incorrect because $\frac{EF}{DE} = \frac{AC}{AB}$, not $\frac{BC}{AB}$.

Question Difficulty: Medium

Question ID a4c05a1b

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

ID: a4c05a1b



Note: Figure not drawn to scale.

In the figure shown, lines r and s are parallel, and line m intersects both lines. If $y < 65$, which of the following must be true?

- A. $x < 115$
- B. $x > 115$
- C. $x + y < 180$
- D. $x + y > 180$

ID: a4c05a1b Answer

Correct Answer: B

Rationale

Choice B is correct. In the figure shown, the angle measuring y° is congruent to its vertical angle formed by lines s and m , so the measure of the vertical angle is also y° . The vertical angle forms a same-side interior angle pair with the angle measuring x° . It's given that lines r and s are parallel. Therefore, same-side interior angles in the figure are supplementary, which means the sum of the measure of the vertical angle and the measure of the angle measuring x° is 180° , or $x + y = 180$. Subtracting x from both sides of this equation yields $y = 180 - x$. Substituting $180 - x$ for y in the inequality $y < 65$ yields $180 - x < 65$. Adding x to both sides of this inequality yields $180 < 65 + x$. Subtracting 65 from both sides of this inequality yields $115 < x$, or $x > 115$. Thus, if $y < 65$, it must be true that $x > 115$.

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

Choice C is incorrect. $x + y$ must be equal to, not less than, 180.

Choice D is incorrect. $x + y$ must be equal to, not greater than, 180.

Question Difficulty: Medium

Question ID d3fe472f

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

ID: d3fe472f

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: d3fe472f 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 2×16 , 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 fd8745fc

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

ID: fd8745fc

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: fd8745fc 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 c7bed21d

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

ID: c7bed21d

Quadrilateral $P'Q'R'S'$ is similar to quadrilateral $PQRS$, where P , Q , R , and S correspond to P' , Q' , R' , and S' , respectively. The measure of angle P is 30° , the measure of angle Q is 50° , and the measure of angle R is 70° . The length of each side of $P'Q'R'S'$ is **3** times the length of each corresponding side of $PQRS$. What is the measure of angle P' ?

- A. 10°
- B. 30°
- C. 40°
- D. 90°

ID: c7bed21d Answer

Correct Answer: B

Rationale

Choice B is correct. It's given that quadrilateral $P'Q'R'S'$ is similar to quadrilateral $PQRS$, where P , Q , R , and S correspond to P' , Q' , R' , and S' , respectively. Since corresponding angles of similar quadrilaterals are congruent, it follows that the measure of angle P is equal to the measure of angle P' . It's given that the measure of angle P is 30° . Therefore, the measure of angle P' is 30° .

Choice A is incorrect. This is $\frac{1}{3}$ the measure of angle P' .

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

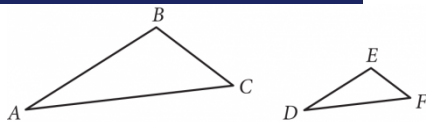
Choice D is incorrect. This is 3 times the measure of angle P' .

Question Difficulty: Medium

Question ID 1c3d613c

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

ID: 1c3d613c



Note: Figures not drawn to scale.

Triangle ABC and triangle DEF are shown. The relationship between the side lengths of the two triangles is such that $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF} = 3$. If the measure of angle BAC is 20° , what is the measure, in degrees, of angle EDF ? (Disregard the degree symbol when gridding your answer.)

ID: 1c3d613c Answer

Rationale

The correct answer is 20. By the equality given, the three pairs of corresponding sides of the two triangles are in the same proportion. By the side-side-side (SSS) similarity theorem, triangle ABC is similar to triangle DEF . In similar triangles, the measures of corresponding angles are congruent. Since angle BAC corresponds to angle EDF , these two angles are congruent and their measures are equal. It's given that the measure of angle BAC is 20° , so the measure of angle EDF is also 20° .

Question Difficulty: Medium

Question ID 901e3285

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

ID: 901e3285

In triangle ABC , the measure of angle A is 50° . If triangle ABC is isosceles, which of the following is NOT a possible measure of angle B ?

- A. 50°
- B. 65°
- C. 80°
- D. 100°

ID: 901e3285 Answer

Correct Answer: D

Rationale

Choice D is correct. The sum of the three interior angles in a triangle is 180° . It's given that angle A measures 50° . If angle B measured 100° , the measure of angle C would be $180^\circ - (50^\circ + 100^\circ) = 30^\circ$. Thus, the measures of the angles in the triangle would be 50° , 100° , and 30° . However, an isosceles triangle has two angles of equal measure. Therefore, angle B can't measure 100° .

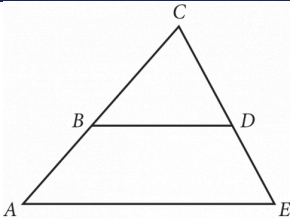
Choice A is incorrect. If angle B has measure 50° , then angle C would measure $180^\circ - (50^\circ + 50^\circ) = 80^\circ$, and 50° , 50° , and 80° could be the angle measures of an isosceles triangle. Choice B is incorrect. If angle B has measure 65° , then angle C would measure $180^\circ - (65^\circ + 50^\circ) = 65^\circ$, and 50° , 65° , and 65° could be the angle measures of an isosceles triangle. Choice C is incorrect. If angle B has measure 80° , then angle C would measure $180^\circ - (80^\circ + 50^\circ) = 50^\circ$, and 50° , 80° , and 50° could be the angle measures of an isosceles triangle.

Question Difficulty: Medium

Question ID 6dd463ca

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

ID: 6dd463ca



Note: Figure not drawn to scale.

In the figure above, segments AE and BD are parallel. If angle BDC measures 58° and angle ACE measures 62° , what is the measure of angle CAE ?

- A. 58°
- B. 60°
- C. 62°
- D. 120°

ID: 6dd463ca Answer

Correct Answer: B

Rationale

Choice B is correct. It’s given that angle ACE measures 62° . Since segments AE and BD are parallel, angles BDC and CEA are congruent. Therefore, angle CEA measures 58° . The sum of the measures of angles ACE , CEA , and CAE is 180° since the sum of the interior angles of triangle ACE is equal to 180° . Let the measure of angle CAE be x° . Therefore, $62 + 58 + x = 180$, which simplifies to $x = 60$. Thus, the measure of angle CAE is 60° .

Choice A is incorrect. This is the measure of angle AEC , not that of angle CAE . Choice C is incorrect. This is the measure of angle ACE , not that of CAE . Choice D is incorrect. This is the sum of the measures of angles ACE and CEA .

Question Difficulty: Medium

Question ID 4ff7b652

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

ID: 4ff7b652

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: 4ff7b652 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