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x is an integer.

Quantity A

$$2^{x+2}$$

Quantity B

$$(4)(2^x)$$

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Select one answer choice.

 My Answer Correct Answer

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Section 3 of 5 | Review Mode: Question 1 of 20

Explanation

By the rules of exponents, Quantity A, 2^{x+2} , can be written as $(2^x)(2^2)$. This expression is equal to $(4)(2^x)$, which is Quantity B. The correct answer is **Choice 3**, that is, **The two quantities are equal**.

This explanation uses the following strategy.

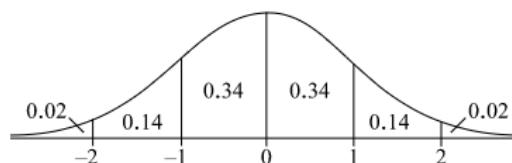
Strategy 5: Simplify an Arithmetic or Algebraic Representation

Difficulty level: 2 (1 = easy, 5 = hard)

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 2 of 20



The figure shows the standard normal distribution, with mean 0 and standard deviation 1, including approximate probabilities corresponding to the six intervals shown.

A random variable W is normally distributed with mean 3.5 and standard deviation 0.5.

Quantity A

The probability that $3.5 < W < 4.5$

Quantity B

The probability that $4.0 < W < 5.0$

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Select one answer choice.

 My Answer Correct Answer

Explanation

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Section 3 of 5 | Review Mode: Question 2 of 20

Explanation

The random variable W is normally distributed with mean 3.5 and standard deviation 0.5. The figure with the question shows the standard normal distribution, which can be used as a reference for any normal distribution, including the distribution of the random variable W . To use the figure, you have to think in terms of numbers of standard deviations above or below the mean, since that is what the numbers on the horizontal axis refer to.

Quantity A is the probability that $3.5 < W < 4.5$. Since the random variable W has mean 3.5 and standard deviation 0.5, it follows that 3.5 is 0 standard deviations from the mean, and 4.5 is 2 standard deviations above the mean. Hence the values 3.5 and 4.5 correspond to the numbers 0 and 2, respectively, in the figure. The probability that $3.5 < W < 4.5$ is equal to the sum of the probability corresponding to the interval from 0 to 1 and the probability corresponding to the interval from 1 to 2. From the figure, the sum of these probabilities is approximately $0.34 + 0.14$, or 0.48.

Quantity B is the probability that $4.0 < W < 5.0$. Since the random variable W has mean 3.5 and standard deviation 0.5, it follows that 4.0 is 1 standard deviation above the mean, and 5.0 is 3 standard deviations above the mean. Hence the values 4.0 and 5.0 correspond to the numbers 1 and 3, respectively, in the figure. The probability that $4.0 < W < 5.0$ is equal to the sum of the probability corresponding to the interval from 1 to 2 and the probability corresponding to the interval from 2 to 3, which is slightly less than the sum of the probability corresponding to the interval from 1 to 2 and the probability corresponding to the interval of all numbers greater than 2. From the figure, the sum of these probabilities is slightly less than $0.14 + 0.02$, or 0.16.

Since $0.48 > 0.16$, the correct answer is **Choice 1**, that is, **Quantity A is greater**.

This explanation uses the following strategies.

Strategy 2: Translate from Words to a Figure or Diagram

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 3 of 20

$$w > 0$$

$$x < 2w$$

$$y > 5w$$

Quantity A

$$\frac{y - x}{3}$$

Quantity B

$$w$$

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Select one answer choice.

 My Answer Correct Answer[Explanation](#)[Exit Section](#)[Review](#)[Back](#)[Next](#)

Section 3 of 5 | Review Mode: Question 3 of 20

Explanation



You are given that $y > 5w$ and $x < 2w$, and that $w > 0$, and asked to compare Quantity A, which is $\frac{y - x}{3}$, with Quantity B, which is just w . You can use the given inequalities to find the relationship between the two quantities as follows.

Step 1: Note that $x < 2w$ implies $-x > -2w$.

Step 2: Adding corresponding sides of the inequalities $-x > -2w$ and $y > 5w$ gives the inequality $y - x > 5w - 2w$, which simplifies to $y - x > 3w$.

Step 3: Dividing both sides of the inequality $y - x > 3w$ by 3 gives the inequality $\frac{y - x}{3} > w$.

The correct answer is **Choice 1**, that is, **Quantity A is greater**.

This explanation uses the following strategies.

Strategy 5: Simplify an Arithmetic or Algebraic Representation

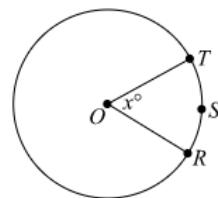
Strategy 8: Search for a Mathematical Relationship

Difficulty level: 2 (1 = easy, 5 = hard)

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 4 of 20



Point O is the center of the circle shown. Line segment OT and arc RST both have length 4.

Quantity A x Quantity B

60

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

[Select one answer choice.](#)

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Section 3 of 5 | Review Mode: Question 4 of 20

Explanation



In the figure with the question, line segments OT and OR are radii of the circle, the measure of angle ROT , the central angle subtended by arc RST is x° . You are asked to compare x with 60.

Recall that the ratio of the length of an arc of a circle to the circumference of the circle is equal to the ratio of the measure of the central angle subtended by that arc to 360° . Given that the length of radius OT is 4, the circumference of the circle is $(2\pi)(4)$. Given that the length of arc RST is 4, the equal ratios give you the equation $\frac{4}{(2\pi)(4)} = \frac{x}{360}$.

Solving the equation for x gives $x = \frac{180}{\pi}$. Since $\pi > 3$, it follows that $\frac{180}{\pi} < \frac{180}{3}$, that is, $x < 60$. So Quantity A is less than Quantity B, and the correct answer is **Choice 2**, that is, **Quantity B is greater**.

This explanation uses the following strategies.

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Strategy 9: Estimate

Difficulty level: 4 (1 = easy, 5 = hard)

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 5 of 20

$$(x + 5)^2 - (y - 3)^2 = 0$$

$$x + y = 2$$

Quantity A

$$x - y$$

Quantity B

$$0$$

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 5 of 20

Explanation

You are given two equations involving x and y and you are asked to compare $x - y$ with 0. You can simplify the first equation $(x + 5)^2 - (y - 3)^2 = 0$ as follows:

Step 1: $(x + 5)^2 - (y - 3)^2 = 0$

Step 2: $(x + 5)^2 = (y - 3)^2$

Step 3: $x + 5 = \pm(y - 3)$

The equation in Step 3 represents two cases to be considered, first $x + 5 = y - 3$, and then $x + 5 = -(y - 3)$.

Case 1: $x + 5 = y - 3$. Solving this equation for $x - y$ gives the equation $x - y = -3 - 5$, which simplifies to $x - y = -8$. In this case $x - y$ is less than 0, and Quantity A is less than Quantity B.

Case 2: $x + 5 = -(y - 3)$. This equation simplifies to $x + 5 = -y + 3$. You cannot solve this equation for $x - y$ directly, but you can determine that $x + y = 3 - 5$, which simplifies to $x + y = -2$. Note that this contradicts the second equation given, namely $x + y = 2$. This contradiction shows that the second case is not possible. Only the first case is possible, which implies that Quantity A is less than Quantity B. The correct answer is **Choice 2**, that is, **Quantity B is greater**.

This explanation uses the following strategies.

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Strategy 11: Divide into Cases

Difficulty level: 4 (1 = easy, 5 = hard)

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 6 of 20

$$x \neq 1$$

Quantity A

$$\frac{x^2 - 2}{x - 1}$$

Quantity B

$$x + 2$$

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 6 of 20

Explanation



In this question you are given that $x \neq 1$, and you are asked to compare Quantity A, $\frac{x^2 - 2}{x - 1}$, with Quantity B, $x + 2$. To explore the relationship between Quantities A and B, you can substitute some easy values for x .

If $x = 0$, then Quantity A is $\frac{0^2 - 2}{0 - 1}$, which is equal to 2, and Quantity B is $0 + 2$, which is also equal to 2. So when $x = 0$, the two quantities are equal.

If $x = 2$, then Quantity A is $\frac{2^2 - 2}{2 - 1}$, which is equal to 2, and Quantity B is $2 + 2$, which is equal to 4. So when $x = 2$, Quantity B is greater.

Since in one case the two quantities are equal and in the other case Quantity B is greater, the correct answer is **Choice 4**, that is, **The relationship cannot be determined from the information given**.

This explanation uses the following strategies.

Strategy 10: Trial and Error

Strategy 13: Determine Whether a Conclusion Follows from the Information Given

Difficulty level: 4 (1 = easy, 5 = hard)

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 7 of 20

Quantity A

$$\frac{(-4)^{-3}}{4^{-5}}$$

Quantity B

$$\frac{(-4)^3}{4^5}$$

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 7 of 20

Explanation



You can simplify both quantities by applying rules of exponents.

For Quantity A, you have $\frac{(-4)^{-3}}{4^{-5}} = \frac{4^5}{(-4)^3} = \frac{4^5}{-4^3} = -4^2$, which is -16 .

For Quantity B, you have $\frac{(-4)^3}{4^5} = \frac{-4^3}{4^5} = -\frac{1}{4^2}$, which is $-\frac{1}{16}$.

Since $-\frac{1}{16}$ is greater than -16 , the correct answer is **Choice 2**, that is, **Quantity B is greater**.

This explanation uses the following strategy.

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Difficulty level: 4 (1 = easy, 5 = hard)

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 8 of 20

Quantity A

The standard deviation of the heights of 12 people whose heights extend from 62 inches to 74 inches

Quantity B

The standard deviation of the heights of 12 people whose heights extend from 60 inches to 72 inches

- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Select one answer choice.

 My Answer Correct Answer

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Section 3 of 5 | Review Mode: Question 8 of 20

Explanation

Recall that the standard deviation of a group of numbers is a measure of the spread of the numbers around the mean of the numbers.

In this question you are asked to compare Quantity A, the standard deviation of a group of 12 heights extending from 62 inches to 74 inches, with Quantity B, the standard deviation of a group of 12 heights extending from 60 inches to 72 inches. Note that you are given the least and greatest heights in each group of heights. From this information you can determine that the two groups of heights have the same range, 12. However, you cannot draw any other conclusions about the spread of the heights in either group about the mean. Therefore you cannot compare the standard deviations of the two groups of heights.

To see this more clearly, consider the following two possibilities for the two groups of 12 heights, in inches:

Case 1

Group A: 62, 68, 68, 68, 68, 68, 68, 68, 68, 68, 68, 74

Group B: 60, 66, 66, 66, 66, 66, 66, 66, 66, 66, 66, 72

Note that group B is formed by “shifting” group A down by 2, so the mean of the 12 heights in group B is 2 less than the mean of the 12 heights in group A, and the spread of the 12 heights in group A about the mean is the same as the spread of the 12 heights in group B about the mean. Thus in this case the standard deviation of the 12 heights in group A is equal to the standard deviation of the 12 heights in group B.

Case 2

Group A: 62, 68, 68, 68, 68, 68, 68, 68, 68, 68, 68, 74

Group B: 60, 60, 60, 60, 60, 60, 72, 72, 72, 72, 72, 72

Select one answer choice.

 My Answer Correct Answer

Explanation

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Section 3 of 5 | Review Mode: Question 8 of 20

Explanation

Group A: 62, 68, 68, 68, 68, 68, 68, 68, 68, 68, 68, 74

Group B: 60, 66, 66, 66, 66, 66, 66, 66, 66, 66, 66, 72

Note that group B is formed by “shifting” group A down by 2, so the mean of the 12 heights in group B is 2 less than the mean of the 12 heights in group A, and the spread of the 12 heights in group A about the mean is the same as the spread of the 12 heights in group B about the mean. Thus in this case the standard deviation of the 12 heights in group A is equal to the standard deviation of the 12 heights in group B.

Case 2

Group A: 62, 68, 68, 68, 68, 68, 68, 68, 68, 68, 68, 74

Group B: 60, 60, 60, 60, 60, 60, 72, 72, 72, 72, 72, 72

Note that the 12 heights in group A are the same as the 12 heights in group A in Case 1, and the 12 heights in group B are more spread out than the 12 heights in group B in Case 1. Thus in this case the standard deviation of the 12 heights in group B is greater than the standard deviation of the 12 heights in group A.

The correct answer is **Choice 4**, that is, **The relationship cannot be determined from the information given.**

This explanation uses the following strategies.

Strategy 8: Search for a Mathematical Relationship

Strategy 13: Determine Whether a Conclusion Follows from the Information Given

Difficulty level: 5 (1 = easy, 5 = hard)

Select one answer choice.

 My Answer Correct Answer

Explanation

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Section 3 of 5 | Review Mode: Question 9 of 20

Weekly Rental of Storage Sheds

Size	Capacity (square feet)	Cost
Small	x	\$12
Medium	$3x$	\$28
Large	$4x$	\$39

The table shows weekly rental costs of storage sheds. A company requires a total storage capacity equal to the combined storage capacity of 16 small sheds. Which of the following rentals would cost the least amount per week for the company's storage capacity requirements?

- 4 medium sheds and 4 small sheds
- 5 medium sheds and 1 small shed
- 1 large shed and 4 medium sheds
- 2 large sheds, 2 medium sheds, and 2 small sheds
- 3 large sheds, 1 medium shed, and 1 small shed

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 9 of 20

Explanation



Note that all of the rentals in the answer choices have a combined storage capacity of 16 small sheds. To determine which of the rentals given in the choices would cost the least amount per week, you can compute the weekly cost for each choice and then compare the costs.

Choice 1: The weekly rental cost for 4 medium sheds and 4 small sheds is $4(\$28) + 4(\$12)$, or \$160.

Choice 2: The weekly rental cost for 5 medium sheds and 1 small shed is $5(\$28) + \12 , or \$152.

Choice 3: The weekly rental cost for 1 large shed and 4 medium sheds is \$39 + 4(\$28), or \$151.

Choice 4: The weekly rental cost for 2 large sheds, 2 medium sheds, and 2 small sheds is $2(\$39) + 2(\$28) + 2(\$12)$, or \$158.

Choice 5: The weekly rental cost for 3 large sheds, 1 medium shed, and 1 small shed is $3(\$39) + \$28 + \$12$, or \$157.

The least of the costs is \$151, the cost for Choice 3. The correct answer is **Choice 3**, that is, **1 large shed and 4 medium sheds**.

This explanation uses the following strategies.

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

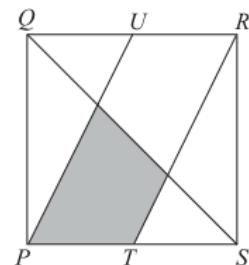
Strategy 8: Search for a Mathematical Relationship

Difficulty level: 1 (1 = easy, 5 = hard)

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 10 of 20



In the figure shown, $PQRS$ is a square, T is the midpoint of side PS , and U is the midpoint of side QR .
The area of the shaded region is what fraction of the area of square $PQRS$?

- $\frac{1}{8}$ $\frac{1}{6}$ $\frac{1}{5}$ $\frac{1}{4}$ $\frac{1}{3}$

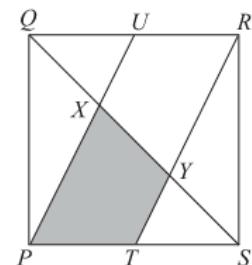
Select one answer choice.

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Section 3 of 5 | Review Mode: Question 10 of 20

Explanation

For convenience, here is the figure with the question with 2 additional points labeled.



Note that diagonal QS divides square $PQRS$ into two isosceles right triangles, QPS and QRS , and line segments PU and TR divide each of the isosceles right triangles into two smaller triangles and a quadrilateral. Note that the shaded region referred to in the question is the quadrilateral region $PXYT$ in isosceles right triangle QPS . The area of the shaded region is equal to the area of isosceles right triangle QPS , minus the sum of the areas of the two smaller triangles inside triangle QPS , that is, triangle PQX and triangle TYS .

Note that the area of triangle TYS is equal to the area of triangle UXQ . This is true because, in fact, these two triangles are congruent. To see this, note that the length of side TS and the length of side QU are each $\frac{1}{2}$ of the length of a side of the square, angle YST and angle XQU each measure 45° , and angle YTS and angle XUQ have equal measure since right triangle RST is congruent to right triangle PQU . Thus the sum of the areas of triangle PQX and triangle TYS is equal to the area of right triangle PQU . Note also that the area of right triangle PQU is equal to $\frac{1}{4}$ of the area of square $PQRS$. Therefore the area of the shaded region is equal to the area of isosceles right

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 10 of 20

Explanation

shaded region referred to in the question is the quadrilateral region $PXYT$ in isosceles right triangle QPS . The area of the shaded region is equal to the area of isosceles right triangle QPS , minus the sum of the areas of the two smaller triangles inside triangle QPS , that is, triangle PQX and triangle TYS .

Note that the area of triangle TYS is equal to the area of triangle UXQ . This is true because, in fact, these two triangles are congruent. To see this, note that the length of side TS and the length of side QU are each $\frac{1}{2}$ of the length of a side of the square, angle YST and angle XQU each measure 45° , and angle YTS and angle XUQ have equal measure since right triangle RST is congruent to right triangle PQU . Thus the sum of the areas of triangle PQX and triangle TYS is equal to the area of right triangle PQU . Note also that the area of right triangle PQU is equal to $\frac{1}{4}$ of the area of square $PQRS$. Therefore the area of the shaded region is equal to the area of isosceles right triangle QPS minus the area of right triangle PQU , which is equal to $\frac{1}{2}$ of the area of the square minus $\frac{1}{4}$ of the area of the square, which is $\frac{1}{4}$ of the area of the square.

The correct answer is **Choice 4**, that is, $\frac{1}{4}$.

This explanation uses the following strategies.

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Strategy 8: Search for a Mathematical Relationship

Difficulty level: 2 (1 = easy, 5 = hard)

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 11 of 20

When the positive integer n is divided by 20, the remainder is 15. Which of the following must be a divisor of n ?

- 3
- 5
- 6
- 7
- 10

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 11 of 20

Explanation



In the question you are told that when the positive integer n is divided by 20, the remainder is 15. The first few positive integers n that satisfy this condition are 15, 35, 55, and 75. Note that the only integer greater than 1 that is a divisor of 15, 35, 55, and 75 is 5. Does 5 have to be a divisor of all positive integers n that satisfy the given condition? Note that any positive integer that meets this condition can be written in the form $20k + 15$, where k is a nonnegative integer. Since $20k + 15$ can be factored as $5(4k + 3)$, you can conclude that the integer 5 must be a divisor of all positive integers n that satisfy the given condition. The correct answer is **Choice 2**, that is, **5**.

This explanation uses the following strategies.

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Strategy 8: Search for a Mathematical Relationship

Difficulty level: 3 (1 = easy, 5 = hard)

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 12 of 20

Twenty-three cards are numbered with the integers from 1 to 23. If one card is to be randomly selected from the 23 cards, what is the probability that the integer on the selected card will be a multiple of 3 or a multiple of 4 or a multiple of both 3 and 4?

 $\frac{7}{23}$ $\frac{9}{23}$ $\frac{11}{23}$ $\frac{12}{23}$ $\frac{13}{23}$

Select one answer choice.

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Section 3 of 5 | Review Mode: Question 12 of 20

Explanation



Among the integers from 1 to 23, there are seven multiples of 3, five multiples of 4, and one multiple of both 3 and 4, which is 12. The probability that the integer on the selected card will be a multiple of 3 or 4, or both, is therefore $\frac{7+5-1}{23}$, or $\frac{11}{23}$. The correct answer is **Choice 3**, that is, $\frac{11}{23}$.

This explanation uses the following strategy.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Difficulty level: 3 (1 = easy, 5 = hard)

at is

Select one answer choice.

 My Answer Correct Answer

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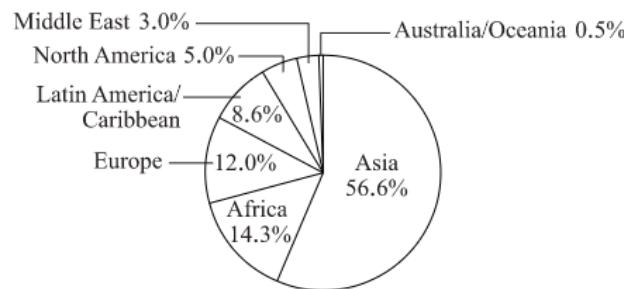
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Section 3 of 5 | Review Mode: Question 14 of 20

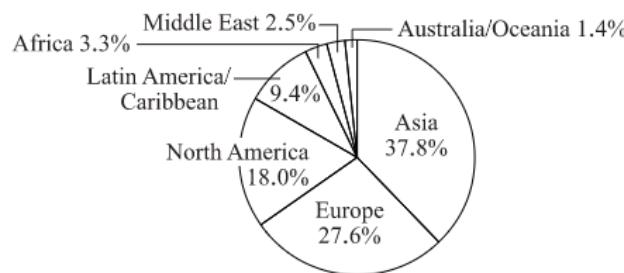
Questions 14 to 16 are based on the following data.

World Population and Internet Use, March 2008**Distribution of World Population by Region**

Total: 6,676 million

**Distribution of Internet Users by Region**

Total: 1,355 million



Which of the following is closest to the fraction of the world population who were Internet users?

- $\frac{1}{20}$
- $\frac{1}{10}$
- $\frac{1}{5}$
- $\frac{1}{3}$
- $\frac{1}{2}$

Select one answer choice.

 My Answer Correct Answer

Explanation

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Section 3 of 5 | Review Mode: Question 14 of 20

Explanation

From the totals given with each circle graph, there were 1,355 million Internet users in the world population of 6,676 million. So the fraction of the world population who were Internet users was $\frac{1,355}{6,676}$, or approximately 0.203. Of the fractions given in the answer choices, $\frac{1}{5}$ is the closest to 0.203. The correct answer is **Choice 3**, that is, $\frac{1}{5}$.

This explanation uses the following strategies.

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Strategy 9: Estimate

Difficulty level: 1 (1 = easy, 5 = hard)

Select one answer choice.

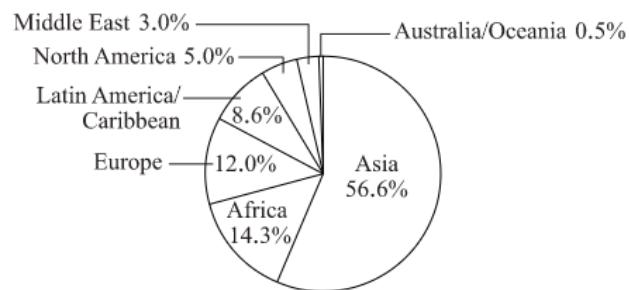
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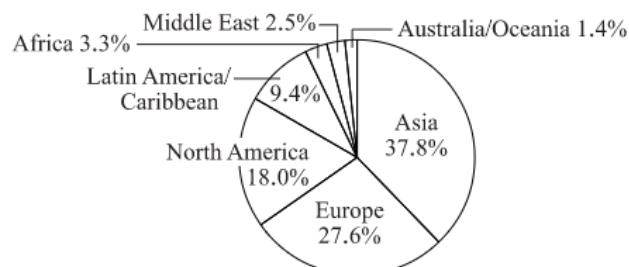
Questions 14 to 16 are based on the following data.

World Population and Internet Use, March 2008**Distribution of World Population by Region**

Total: 6,676 million

**Distribution of Internet Users by Region**

Total: 1,355 million



For which of the following regions was the number of Internet users greater than the population of the Middle East?

Indicate all such regions.

- Africa
- Asia
- Europe
- Latin America/Caribbean
- North America

Select one or more answer choices.

 My Answer Correct Answer[Explanation](#)[Exit Section](#)[Review](#)[Back](#)[Next](#)

Section 3 of 5 | Review Mode: Question 15 of 20

Explanation

number of
the

From the circle graph showing the distribution of world population by region, the population of the Middle East was 3.0% of 6,676 million, which is $(0.03)(6,676)$ million, or 200.28 million. From the totals given with the circle graph showing the distribution of Internet users, there were 1,355 million Internet users. The population of the Middle East, expressed as a percent of the total number of Internet users, is $\left(\frac{200.28}{1,355}\right)(100\%)$, or approximately 14.8%.

From the circle graph showing the distribution of Internet users, the regions that had more than 14.8% of Internet users were Asia, Europe, and North America. The correct answer consists of **Choices 2, 3, and 5**, that is, **Asia, Europe, and North America**.

This explanation uses the following strategies.

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Strategy 8: Search for a Mathematical Relationship

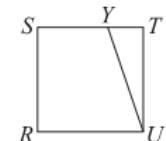
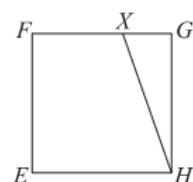
Strategy 9: Estimate

Difficulty level: 2 (1 = easy, 5 = hard)

Select one or more answer choices.

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In the figure shown, $EFGH$ is a square with sides of length 12, and $RSTU$ is a square with sides of length 9. If the ratio of the area of square $EFGH$ to the area of square $RSTU$ is equal to the ratio of the area of triangle XGH to the area of triangle $Y TU$, what is the ratio of the length of XG to the length of YT ?

Give your answer as a fraction.

4
3

Enter your answer as a fraction, with the numerator and denominator in their respective answer boxes. Backspace to erase.

 My Answer Correct Answer

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Explanation

In this question you are asked to find the ratio of the length of XG to the length of YT and give your answer as a fraction. Note that XG is a side of right triangle XGH , which is in square $EFGH$, and that YT is a side of right triangle YTU , which is in square $RSTU$.

Since the sides of square $EFGH$ are of length 12 and the sides of square $RSTU$ are of length 9, it follows that the ratio of the area of square $EFGH$ to the area of square $RSTU$ is $\frac{12^2}{9^2}$.

Note that the area of right triangle XGH is $\frac{1}{2}(XG)(GH)$, or $\frac{12(XG)}{2}$, and the area of right triangle YTU is $\frac{1}{2}(YT)(TU)$, or $\frac{9(YT)}{2}$. Therefore the ratio of the area of right triangle XGH to the area of right triangle YTU is $\frac{\frac{12(XG)}{2}}{\frac{9(YT)}{2}}$, or $\frac{12(XG)}{9(YT)}$. Since you are given that the ratio of the area of square $EFGH$ to the area of square $RSTU$ is $\frac{12^2}{9^2} = \frac{12(XG)}{9(YT)}$. Multiplying both sides of this equation by $\frac{9}{12}$ and simplifying gives the equation $\frac{XG}{YT} = \frac{4}{3}$. Thus the ratio of the length of XG to the length of YT is $\frac{4}{3}$. The correct answer is $\frac{4}{3}$.

This explanation uses the following strategies.

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Enter your answer as a fraction, with the numerator and denominator in their respective answer boxes. Backspace to erase.

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Section 3 of 5 | Review Mode: Question 18 of 20

The sequence of numbers $c_1, c_2, c_3, \dots, c_n, \dots$ is defined by $c_1 = 2$, $c_2 = 4$, and $c_n = c_{n-1} + n$ for each integer n greater than 2. What is the value of c_6 ?

 12 17 18 22 24

Select one answer choice.

 My Answer Correct Answer

Explanation

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Section 3 of 5 | Review Mode: Question 18 of 20

Explanation

Since you are given that $c_1 = 2$, $c_2 = 4$, and $c_n = c_{n-1} + n$ for each integer n greater than 2, you can calculate consecutive terms of the sequence until you get to c_6 , as follows.

$$c_1 = 2$$

$$c_2 = 4$$

$$c_3 = c_2 + 3 = 4 + 3 = 7$$

$$c_4 = c_3 + 4 = 7 + 4 = 11$$

$$c_5 = c_4 + 5 = 11 + 5 = 16$$

$$c_6 = c_5 + 6 = 16 + 6 = 22$$

The correct answer is **Choice 4**, that is, **22**.

This explanation uses the following strategy.

Strategy 7: Find a Pattern

Difficulty level: 4 (1 = easy, 5 = hard)

Select one answer choice.

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At 12:00 noon a hose began draining water from a pool at a constant rate of 120 ounces per minute. At 2:00 that afternoon, an additional hose began draining water from the pool, increasing the constant rate at which the water was being drained to 240 ounces per minute. The pool was empty before 4:30 that afternoon. Which of the following could have been the amount of water, in ounces, in the pool at 12:00 noon that day?

Indicate all such amounts.

- 42,640
- 46,080
- 50,250
- 52,540
- 55,320

Select one or more answer choices.

 My Answer Correct Answer

Explanation

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Explanation

From 12:00 noon to 2:00 in the afternoon, that is, for 120 minutes, water drained from the pool at a rate of 120 ounces per minute. The total amount of water drained during that time was $(120)(120)$, or 14,400 ounces.

From 2:00 in the afternoon until sometime before 4:30 in the afternoon, that is, for less than $2\frac{1}{2}$ hours, water drained at a rate of 240 ounces per minute. Since $2\frac{1}{2}$ hours is 150 minutes, the amount of water drained during that time was less than $(240)(150)$, or 36,000 ounces.

Adding the two amounts, you see that the total amount of water drained was less than 50,400 ounces. So any amount between 14,400 and 50,400 ounces could be the amount of water initially in the pool at 12:00 noon. Of the answer choices, 42,640, 46,080, and 50,250 are between these two amounts.

The correct answer consists of **Choices 1, 2, and 3**, that is, **42,640, 46,080, and 50,250**.

This explanation uses the following strategies.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Strategy 8: Search for a Mathematical Relationship

Difficulty level: 3 (1 = easy, 5 = hard)

Select one or more answer choices.

 My Answer Correct Answer

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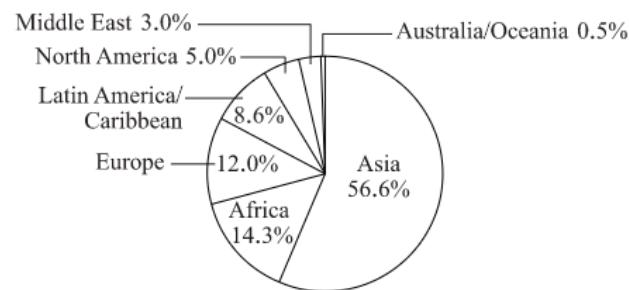
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Section 3 of 5 | Review Mode: Question 16 of 20

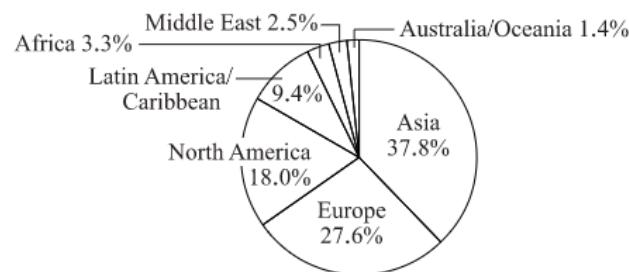
Questions 14 to 16 are based on the following data.

World Population and Internet Use, March 2008**Distribution of World Population by Region**

Total: 6,676 million

**Distribution of Internet Users by Region**

Total: 1,355 million



The number of Internet users in Europe and Asia combined was closest to what percent of the world population?

 13.3% 44.6% 65.4% 68.6% 70.9%

Select one answer choice.

 My Answer Correct Answer[Explanation](#)[Exit Section](#)[Review](#)[Back](#)[Next](#)

Section 3 of 5 | Review Mode: Question 16 of 20

Explanation

Asia
world

From the circle graph showing the distribution of Internet users, the percent of Internet users in Europe and Asia combined was $27.6\% + 37.8\%$, or 65.4% , of all Internet users, which is $(0.654)(1,355)$ million, or 886.17 million users. As a percent of the world population, the number of users was $\left(\frac{886.17}{6,676}\right)(100\%)$, or approximately 13.3%. The correct answer is **Choice 1**, that is, **13.3%**.

This explanation uses the following strategies.

Strategy 4: Translate from a Figure to an Arithmetic or Algebraic Representation

Strategy 9: Estimate

Difficulty level: 2 (1 = easy, 5 = hard)

Select one answer choice.

 My Answer Correct Answer[Explanation](#)[Exit Section](#)[Review](#)[Back](#)[Next](#)

Section 3 of 5 | Review Mode: Question 20 of 20

A product is on sale for a discounted price that is 20 percent less than its regular price. The regular price is what percent greater than the discounted price?

 %

Enter your answer as an integer or a decimal in the answer box. Backspace to erase.

 My Answer Correct Answer[Explanation](#)[Exit Section](#)[Review](#)[Back](#)[Next](#)

Section 3 of 5 | Review Mode: Question 20 of 20

Explanation

If r is the regular price of the product, then the discounted price is $0.8r$. The regular price as a percent of the discounted price is $\left(\frac{r}{0.8r}\right)(100\%) = 125\%$, so the regular price is 25% greater than the discounted price. The correct answer is **25%**.

This explanation uses the following strategy.

Strategy 1: Translate from Words to an Arithmetic or Algebraic Representation

Difficulty level: 4 (1 = easy, 5 = hard)

Enter your answer as an integer or a decimal in the answer box. Backspace to erase.

 My Answer Correct Answer[Explanation](#)[Exit Section](#)[Review](#)[Back](#)[Next](#)

Section 3 of 5 | Review Mode: Question 19 of 20

Square S is inscribed in circle C , and circle R is inscribed in square S . What is the ratio of the area of circle C to the area of circle R ?

- 2 to 1
- 1 to 1
- 2 to $\sqrt{2}$
- 1 to 2
- 1 to 3

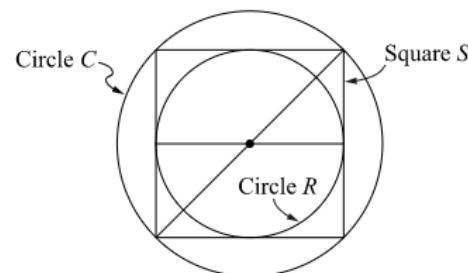
Select one answer choice.

 My Answer Correct Answer[Explanation](#)[Exit Section](#)[Review](#)[Back](#)[Next](#)

Section 3 of 5 | Review Mode: Question 19 of 20

Explanation

In this question you are given that square S is inscribed in large circle C and small circle R is inscribed in square S . The following figure shows the relative positions of circle C , square S , and circle R together with the diameters of the two circles.



From the figure you can see that the diameter of large circle C is also a diagonal of square S . If d is the length of the diameter of circle C and h is the length of a side of square S , then by the Pythagorean theorem,

$d^2 = h^2 + h^2 = 2h^2$, or $d = \sqrt{2}h$. In terms of d , the area of circle C is $\pi\left(\frac{d}{2}\right)^2$. So in terms of h , the area of circle C is $\pi\left(\frac{\sqrt{2}h}{2}\right)^2$, or $\pi\left(\frac{h^2}{2}\right)$.

On the other hand, from the figure you also see that the diameter of small circle R is equal to the length, h , of a side of square S . Therefore the area of circle R , in terms of h , is $\pi\left(\frac{h}{2}\right)^2$, or $\pi\left(\frac{h^2}{4}\right)$.

Select one answer choice.

 My Answer Correct Answer

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Section 3 of 5 | Review Mode: Question 19 of 20

Explanation

$d^2 = h^2 + h^2 = 2h^2$, or $d = \sqrt{2}h$. In terms of d , the area of circle C is $\pi\left(\frac{d}{2}\right)^2$. So in terms of h , the area of circle C is $\pi\left(\frac{\sqrt{2}h}{2}\right)^2$, or $\pi\left(\frac{h^2}{2}\right)$.

On the other hand, from the figure you also see that the diameter of small circle R is equal to the length, h , of a side of square S . Therefore the area of circle R , in terms of h , is $\pi\left(\frac{h}{2}\right)^2$, or $\pi\left(\frac{h^2}{4}\right)$.

$$\frac{\pi\left(\frac{h^2}{2}\right)}{\pi\left(\frac{h^2}{4}\right)}$$

Thus the ratio of the area of circle C to the area of circle R is $\frac{\pi\left(\frac{h^2}{2}\right)}{\pi\left(\frac{h^2}{4}\right)} = \frac{2}{1}$. The correct answer is **Choice 1**, that is,

2 to 1.

This explanation uses the following strategies.

Strategy 2: Translate from Words to a Figure or Diagram

Strategy 5: Simplify an Arithmetic or Algebraic Representation

Strategy 8: Search for a Mathematical Relationship

Difficulty level: 4 (1 = easy, 5 = hard)

Select one answer choice.