

大佬版《数学真题 1200 题》

Version 3.1

公众号：留学大佬 GRE

大佬从 2017 年开始搜集真题， 截止 2021.7.1 日，共搜集 60000 多道 GRE 真题。

2017 年 真题就开始用于教学，2020 年开了 GRE 真题班。反响非常好。很多很多同学短期内（30 天内）轻松考出 330+， 335+， 考完试回来反馈，考试题就是在真题班里做过的原题。当然喽，大佬手里有 GRE 全题库，同学们会考什么，大佬和 ETS 一样清楚！

大佬另外编了三本重磅级真题精华：《大佬版阅读高频 340 篇》浓缩 GRE 题库考的最多次的阅读真题；《大佬版填空高频 340 题》浓缩 GRE 题库中考的最多次数的填空真题；《大佬版填空真题 1000 题》汇聚 2021 年大佬实考完整套题的填空题。

本书完全 复刻 整场 60 道数学题，原题整套编入，不做任何改动，给同学们做原滋原味的真题。专门挑选的是 Q 加试的场次，因为加试的 Q 都更难，给学有余力的同学更多的挑战，更难的题如果都会做，实战就是降维打击，轻松 170！

本书编入的真题，所有，全部，都是 2021 年的真题。

大佬急救班和真题班级群里，每天都在火热讨论真题。

Version 3.1 共 15 场 900 题

更新于 2021 年 7 月 12 日

A safe contains 2 bags of coins and 4 bags of paper money. The total value of the money in the 6 bags is \$1,200.

Quantity A

The total value of the money in the bags that contain coins

Quantity B

\$401

- 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.

R is a function defined as $R(a, b) = \sqrt{b - a}$, for all real numbers a and b , where $a < b$.

Quantity A

$$R(-3, -1)$$

Quantity B

1.8

- 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.

$$27 - k = \frac{k - 17}{4}$$

Quantity A k Quantity B

19

- 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.

11, 21, 15, 9, 3, 17, x

In the list shown, x is a positive integer.

Quantity A

The median of the integers in the list

Quantity B

13

- 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.

The finite sets R , S , and T have the same number of elements. The number of elements in the set $R \cup T$ is less than the number of elements in the set $S \cup T$.

Quantity A

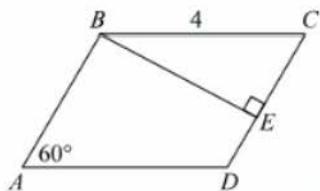
The number of elements in the set $R \cap T$

Quantity B

The number of elements in the set $S \cap T$

- 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.



$ABCD$ is a parallelogram.

Quantity A

CE

Quantity B

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.

Quantity A

The 50th digit to the right of the decimal point
in the decimal expansion of $\frac{2}{7}$

Quantity B

The 50th digit to the right of the decimal point
in the decimal expansion of $\frac{3}{7}$

- 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.

Quantity A

$$\frac{\sqrt[3]{48} + \sqrt[3]{512}}{10 - 12\sqrt[3]{5}}$$

Quantity B

$$\frac{\sqrt[3]{6} + \sqrt[3]{2}}{5 - 6\sqrt[3]{5}}$$

- 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.

A telephone call from City X to City Y costs \$3.00 for the first 3 minutes and \$0.75 per minute for each minute after the first 3 minutes. At this rate, a call from City X to City Y that costs \$12.00 is how many minutes long?

- 4
- 9
- 12
- 15
- 16

Select one answer choice.

$$A = \{6, 9, 12, 15\}$$

$$B = \{-1, -4, -7, -10\}$$

If a number x is to be selected from set A and a number y is to be selected from set B , what is the range of all possible values of $x + y$?

- 9
- 16
- 18
- 19
- 21

Select one answer choice.

A continuous random variable R has a mean of 69 and a standard deviation of 11. What is the value of R that is 0.5 standard deviation below the mean?

- 47
- 57.5
- 58
- 63.5
- 68.5

Select one answer choice.

$x, y, z, u, v, w,$ and t are seven nonzero integers. Which of the following values can be the number of these seven integers that are negative if $xyz = uvwt$?

Indicate all such values.

- Three
- Four
- Five

Select one or more answer choices.

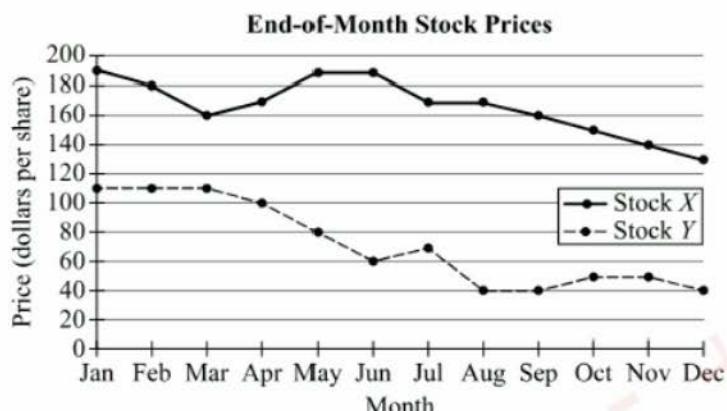
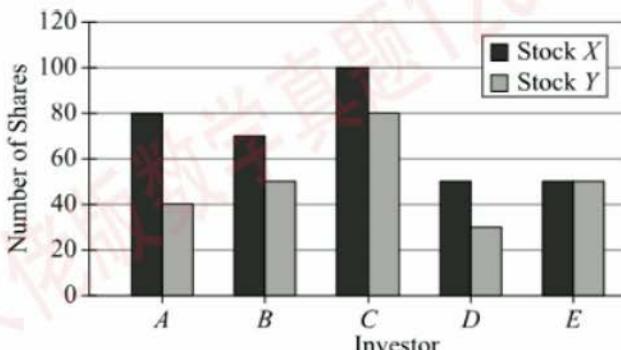
In a survey, 300 people were asked which candidate they had decided to vote for in an upcoming election. Of those surveyed, 35 percent responded that they had decided to vote for Candidate *A*, 42 percent responded that they had decided to vote for Candidate *B*, and the remaining 23 percent responded that they were undecided about which candidate to vote for. What fraction of those surveyed responded that they had decided which candidate they would vote for in the election?

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<input type="text"/>

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

Questions 14 to 16 are based on the following data.

Selected Information for Stocks X and Y**Shares of Stock Purchased by Five Investors at the End of March and Then Sold at the End of May**

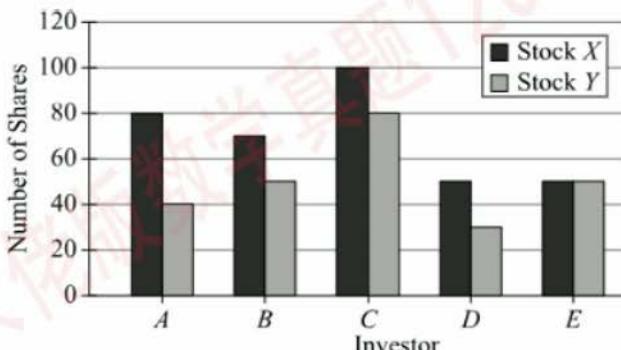
Note: The prices and the numbers of shares are multiples of 10.

Another investor, *F*, purchased a total of 180 shares of Stock *X* and Stock *Y* at the end of March and then sold all the shares at the end of June, earning a total profit of \$600. How many shares of Stock *X* did Investor *F* purchase? (Note: Profit equals selling price minus purchase price.)

 shares

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

Questions 14 to 16 are based on the following data.

Selected Information for Stocks X and Y**Shares of Stock Purchased by Five Investors at the End of March and Then Sold at the End of May**

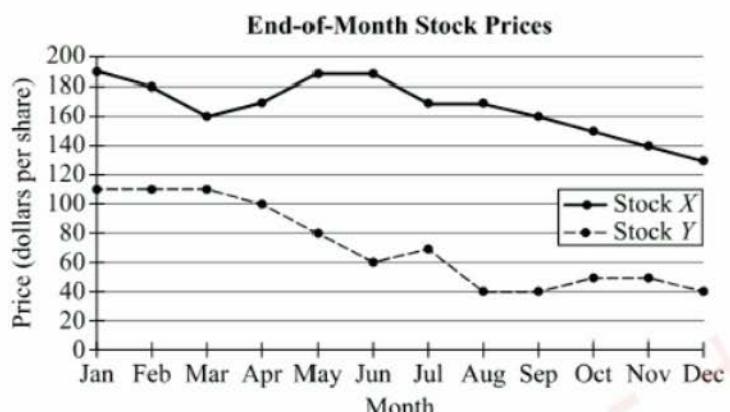
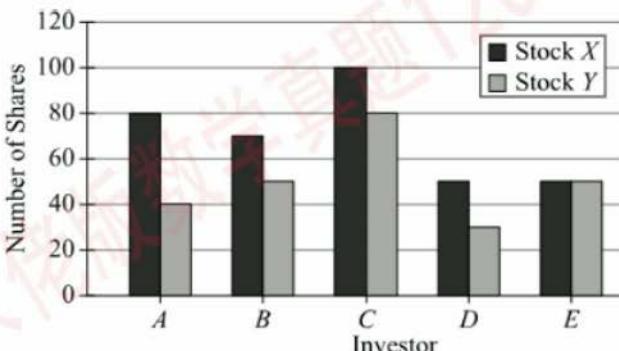
Note: The prices and the numbers of shares are multiples of 10.

For how many of the months shown was 7 times the end-of-month price of Stock Y greater than 2 times the end-of-month price of Stock X?

- One Two Ten Eleven Twelve

Select one answer choice.

Questions 14 to 16 are based on the following data.

Selected Information for Stocks X and Y**Shares of Stock Purchased by Five Investors at the End of March and Then Sold at the End of May**

Note: The prices and the numbers of shares are multiples of 10.

For Investor A, the sum of the prices of all the shares of Stock X and Stock Y purchased at the end of March was p percent less than the sum of the prices of all the shares of Stock X and Stock Y sold at the end of May. Which of the following is closest to the value of p ?

 0.0 1.2 1.7 6.5 7.0

Select one answer choice.

If n is an integer such that $12n - n^2 > 35$, what is the value of n ?

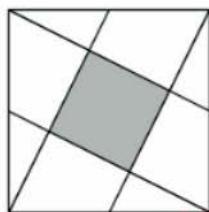
$n =$

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

Asmaa is mixing two types of coffee beans. She will mix x kilograms of coffee beans costing 6 euros per kilogram with y kilograms of coffee beans costing 30 euros per kilogram. If the final mixture will contain 8 kilograms of coffee beans costing 16.5 euros per kilogram, what is the value of x ?

- 4.5
- 5.0
- 5.5
- 6.0
- 6.5

Select one answer choice.



The figure shows a square in which each of four interior line segments connects the midpoint of a side to a vertex of the square. The area of the shaded region is what fraction of the area of the square?

- $\frac{1}{6}$
- $\frac{1}{5}$
- $\frac{\sqrt{5}}{10}$
- $\frac{1}{4}$
- $\frac{\sqrt{3}}{6}$

Select one answer choice.

A piece of wood is in the shape of a right rectangular prism with a square base, where the length of each side of the base is 2 feet and the height of the prism is 0.1 foot. A construction worker placed one of the square faces of the piece of wood on a horizontal surface and made a hole vertically through the wood from the top square face to the bottom square face, where the hole was in the shape of a right circular cylinder with a radius of 0.75 foot and a height of 0.1 foot. Which of the following is closest to the surface area, in square feet, of the piece of wood after the hole was made?

- 4.5
- 5.7
- 6.1
- 7.5
- 9.2

Select one answer choice.

y is a positive even integer.

Quantity A

$$x + y$$

Quantity B

$$x + 1$$

- 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.

$-4 < x < 2$ and $-2 < x < 4$ Quantity A

$|x|$

Quantity B

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.

List $K : 4, x, 5, 8, 5$

For the five numbers in list K , the median is greater than the average (arithmetic mean).

Quantity A

x

Quantity B

3

- 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.

$x \neq y$ and $y \neq 0$ Quantity A

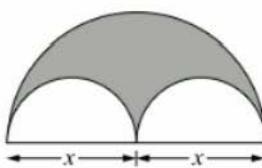
$$\frac{x+y}{y}$$

Quantity B

$$\frac{x^2 - y^2}{xy - y^2}$$

- 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.



The three arcs are semicircles.

Quantity A

The area of the shaded region

Quantity B

The sum of the areas of the two unshaded semicircular regions

- 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.

$$|x| \geq \frac{1}{2}$$

Quantity A

$$x^{-2}$$

Quantity B

$$x^{-4}$$

- 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.

In a survey, 60 percent of those surveyed use long-distance company R , and 20 percent of those who use company R subscribe to an internet service.

Quantity A

The percent of those surveyed who do not subscribe to any internet service

Quantity B

50%

- 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.

In pentagon $ABCDE$, the sum of the measures of interior angles A , B , and C is 270 degrees.

Quantity A

The sum of the measures of interior angles D and E in the pentagon

Quantity B

270 degrees

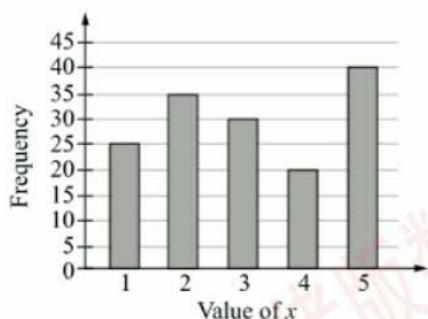
- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Select one answer choice.

At the post office, Sonia purchased mailing envelopes priced at \$3.50 each, including tax, and postcards priced at \$1.25 each, including tax. She paid for the envelopes and postcards with a \$20.00 bill and received \$2.25 in change. How many postcards did Sonia purchase?

- 1
- 2
- 3
- 4
- 5

Select one answer choice.



The variable x takes on the values 1, 2, 3, 4, or 5. The graph shows the frequency distribution for 150 values of x . Which of the following is closest to the average (arithmetic mean) of the 150 values?

- 2.9
- 3.1
- 3.3
- 3.5
- 3.7

Select one answer choice.

How many different positive three-digit integers are there that have an odd hundreds digit?

- 400
- 405
- 495
- 500
- 1,000

Select one answer choice.

N is a 3-digit integer with tens digit t and units digit u . If $621 < N < 685$ and N is a multiple of 3, which of the following must also be a multiple of 3?

- $t + u$
- $t - u$
- tu
- t^u
- u^t

Select one answer choice.

A local store combined two consecutive discounts into a single discount. If the two consecutive discounts were 20 percent off the retail price and then 40 percent off the discounted price, what is the single discount off the retail price that is equivalent to the two consecutive discounts?

 %

A1_GRE

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

Questions 14 to 16 are based on the following data.

**Actions that Affect Computer Security:
a Survey of 250 Companies**

Action Cited	Percent That Cited the Action	Total Amount of Losses Due to the Action Cited (in millions)
Financial fraud	14%	\$19.2
Insider abuse of Internet access	82%	\$10.6
Laptop theft	56%	\$6.5
Sabotage	24%	\$4.8
Theft of proprietary information	20%	\$48.1
Unauthorized access	40%	\$50.2
Virus attack	66%	\$16.6
Total	—	\$156.0

For the seven actions listed in the table, what is the range of the numbers of companies that cited the actions?

 130 140 150 160 170

Select one answer choice.

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Theft of proprietary information	20%	\$48.1
Unauthorized access	40%	\$50.2
Virus attack	66%	\$16.6
Total	—	\$156.0

Which of the following is closest to the amount by which the average (arithmetic mean) dollar amount of losses due to the actions cited exceeds the median dollar amount of the losses?

- \$5,400,000
- \$5,700,000
- \$6,000,000
- \$6,200,000
- \$6,600,000

Select one answer choice.

Questions 14 to 16 are based on the following data.

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Unauthorized access	40%	\$50.2
Virus attack	66%	\$16.6
Total	—	\$156.0

The dollar amount of losses due to financial fraud was what percent greater, to the nearest whole percent, than the dollar amount of losses due to virus attack?

 5% 6% 11% 16% 21%

Select one answer choice.

If p and r are integers such that $x^2 + px - 72 = (x + r)(x - 18)$ for all values of x , what is the value of p ?

$$p = \boxed{}$$

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

If the area of a square is 20, the length of its diagonal is

- $2\sqrt{5}$
- $2\sqrt{10}$
- $5\sqrt{2}$
- $5\sqrt{3}$
- $5\sqrt{10}$

Select one answer choice.

On his trip home, Pat bicycled $\frac{2}{3}$ of the distance, then got a flat tire and walked the remaining distance. If he spent 3 times the amount of time walking that he spent bicycling, his average bicycling speed was how many times as fast as his average walking speed?

- 2
- 3
- 4
- 6
- 9

Select one answer choice.

A research report states that the average (arithmetic mean) of 120 measurements was 72.5, the greatest of the 120 measurements was 92.8, and the range of the 120 measurements was 51.6.

The information given above is sufficient to determine the value of which of the following statistics?

Indicate all such statistics.

- The least of the 120 measurements
- The median of the 120 measurements
- The standard deviation of the 120 measurements
- The sum of the 120 measurements

Select one or more answer choices.

In State X , the average (arithmetic mean) number of dog licenses issued per working day for the 22 working days last July was 4.5 and the average number of dog licenses issued per working day for the 24 working days last August was 2.5.

Quantity A

The average number of dog licenses issued per day in State X for the 46 working days last July and last August combined

Quantity B

3.5

- 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.

The value of $\boxed{x} \boxed{y}$ is defined as $\frac{x}{y} + \frac{y}{x}$ for all nonzero numbers x and y .

Quantity A

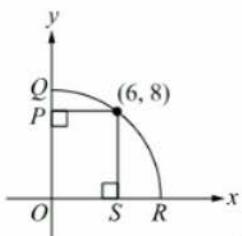
The value of $\begin{array}{|c|c|}\hline 2 & 1 \\ \hline 3 & 4 \\ \hline\end{array}$

Quantity B

3

- 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.



In the xy -plane, QR is an arc of the circle that has center O and passes through the point $(6, 8)$.

Quantity A

The length of SR

Quantity B

3

- 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.

In the xy -plane, n is the number of points on the graph of the equation $3x^2 + 5y^2 = 9$ when $y = 1$.

Quantity A

n

Quantity B

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.

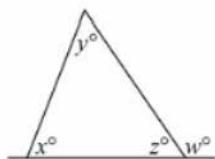
$$\begin{aligned}20 < 4x < 32 \\ 8 < x + 4 < 11\end{aligned}$$

Quantity A x Quantity B

6

- 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.



$$y + z = 110$$

Quantity A

w

Quantity B

110

- 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.

$$a_1, a_2, a_3, \dots, a_n, \dots$$

In the sequence shown, $a_1 = 1$ and for all integers $n \geq 2$,

$$a_n = 2a_{n-1} + r,$$

where r is a positive integer. The sum of a_1 , a_2 , and a_3 is 35.

Quantity A

r

Quantity B

7

- 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.

The average (arithmetic mean) of 6 different positive integers is 12, and x is the greatest of these integers. What is the greatest possible value of x ?

- 51
- 55
- 57
- 62
- 67

Select one answer choice.

$$n = 1! + 2! + 3! + 4! + 5! + 6! + 7! + 8! + 9! + 10!$$

What is the remainder when the integer n is divided by 20 ?

- 19
- 18
- 13
- 12
- 9

Select one answer choice.

On May 1, 2005, the population of Town Y was twice the population of Town X . On May 1 of the years 2006, 2007, and 2008, the population of Town X was 4 percent greater than it was the preceding May 1, and the population of Town Y was 1 percent greater than it was the preceding May 1. On May 1, 2008, the population of Town X was what fraction of the population of Town Y ?

- $\left(\frac{1.04}{1.01}\right)^3$
- $2\left(\frac{1.04}{1.01}\right)^3$
- $\frac{1}{2}\left(\frac{1.04}{1.01}\right)^3$
- $2\left(\frac{1+3(0.04)}{1+3(0.01)}\right)$
- $\frac{1}{2}\left(\frac{1+3(0.04)}{1+3(0.01)}\right)$

Select one answer choice.



On the number line, point M (not shown) is between points K and N , and the coordinate of M is x . If the distance from K to M is the average (arithmetic mean) of the distance from K to N and the distance from M to N , what is the value of x ?

- $\frac{2}{7}$
- $\frac{1}{3}$
- $\frac{2}{5}$
- $\frac{1}{2}$
- $\frac{2}{3}$

Select one answer choice.

P , Q , and R are three points in a plane that are not all on the same line. Which of the following describes the set of all points in the plane that are equally distant from points P , Q , and R ?

- A circle
- A point
- A triangle
- Two lines
- Three lines

Select one answer choice.

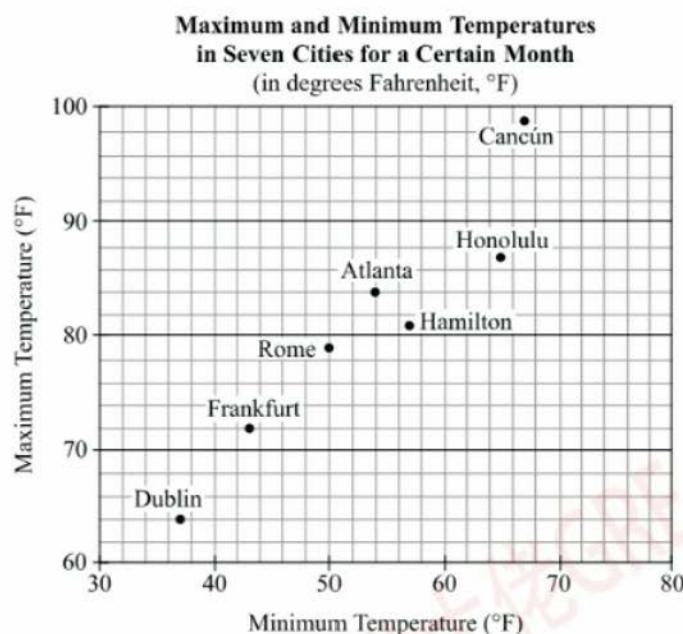
The rental on a certain beach house is \$1,225 per week during the summer months of June, July, and August, and \$110 per day during the rest of the year. Renting the house for 1 week during a summer month is what percent greater than renting the house for 1 week during the rest of the year?

Give your answer to the nearest whole percent.

 %

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

Questions 14 to 16 are based on the following data.



$$T_C = \left(\frac{5}{9}\right)(T_F - 32)$$

The formula above can be used to convert temperatures from degrees Fahrenheit ($^{\circ}\text{F}$) to degrees Celsius ($^{\circ}\text{C}$), where T_F is a certain temperature expressed in degrees Fahrenheit and T_C is the same temperature expressed in degrees Celsius.

What was the maximum temperature in Atlanta, in degrees Celsius, rounded to the nearest degree?

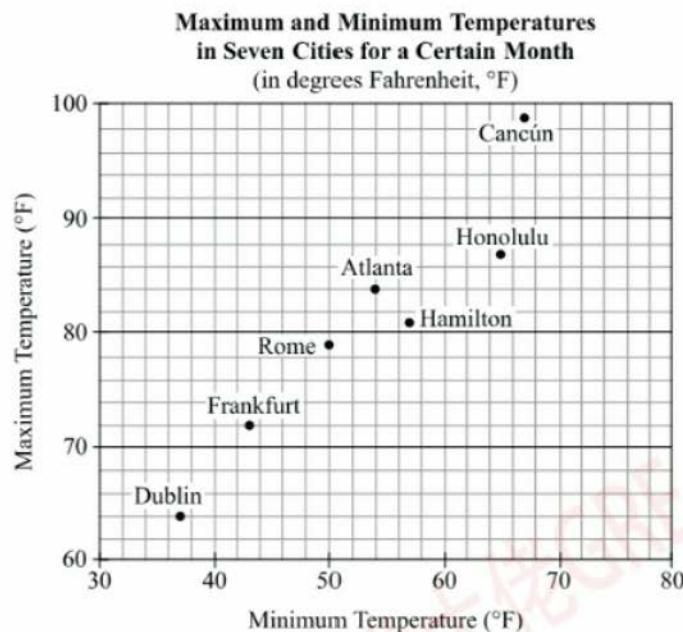
- 37
- 35
- 33
- 31
- 29

Select one answer choice.

Section 6 of 6 | Question 15 of 20

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Questions 14 to 16 are based on the following data.

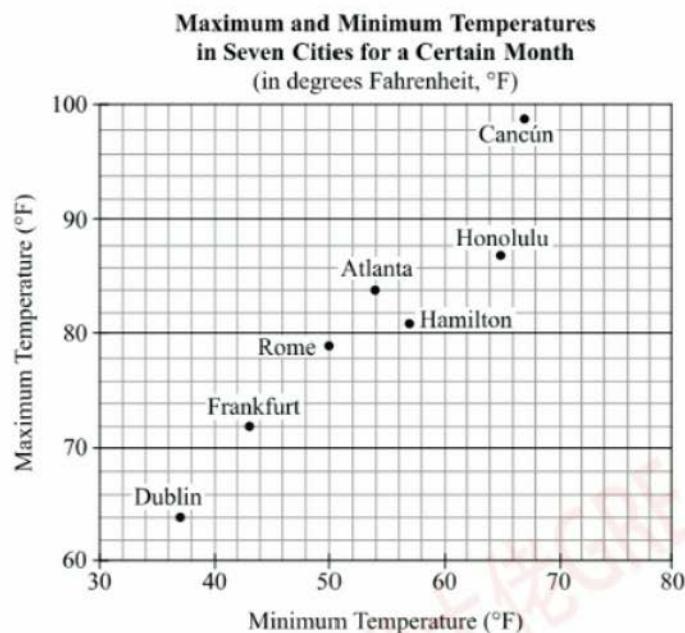


For which city was the maximum temperature equal to the median of the maximum temperatures for the seven cities?

- Atlanta
- Cancún
- Frankfurt
- Hamilton
- Rome

Select one answer choice.

Questions 14 to 16 are based on the following data.



If a pair of different cities is chosen at random from the seven cities, which of the following is closest to the probability that in the pair chosen, the city with the higher maximum temperature is also the city with the lower minimum temperature?

- 0.01
- 0.05
- 0.07
- 0.09
- 0.14

Select one answer choice.

In the xy -plane, the lines with equations $2x - y = 1$ and $x - y = c$, where c is a constant, intersect at a point with the coordinates (a, b) . What is the greatest possible value of c such that both $a \geq 0$ and $b \geq 0$?

A1_GRE

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

Organizations F and G have 20,000 and 30,000 members, respectively. The combined membership of the two organizations is 45,000. If one member of organization F is to be randomly selected, what is the probability that the member selected will also be a member of organization G ?

 $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{5}$ $\frac{1}{6}$ $\frac{1}{9}$

Select one answer choice.

Children's Access to Computers, 1984

Access to Computer	Percent
At home	15
At school	42
At home and at school	10

According to the data in the table, what percent of the children had access to a computer either at home, at school, or both?

- 67%
- 57%
- 52%
- 47%
- 42%

Select one answer choice.

If x is an integer and $y = 3x + 2$, which of the following integers could be a divisor of y ?

Indicate all such integers.

- 4
- 5
- 6
- 7
- 8

Select one or more answer choices.

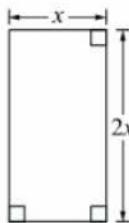
$$x + y = 5$$

$$x - y = -3$$

Quantity A x Quantity B y

- 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.



The perimeter of the figure is 20.

Quantity A

$$2x$$

Quantity B

$$\frac{10}{3}$$

- 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.

A total of 2,200 people attended an awards dinner in a ballroom. The tables in the room were numbered consecutively beginning with 1, and 8 people were seated at each table. If a table had an odd number, it was covered with a red tablecloth; and if a table had an even number, it was covered with a yellow tablecloth.

Quantity A

The number of tables in the ballroom that were covered with a red tablecloth

Quantity B

The number of tables in the ballroom that were covered with a yellow tablecloth

- 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.

Quantity A

$$7^{-4} + 7^{-5}$$

Quantity B

$$8^{-5}$$

- 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.

Set S consists of the multiples of 3 from 9 to 99, inclusive.

Quantity A

The median of the numbers in set S

Quantity B

48

- 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.

In the xy -plane, line ℓ has x -intercept 5 and y -intercept -4 , and line k has x -intercept -4 and y -intercept 5.

Quantity A

The slope of line ℓ

Quantity B

The slope of line k

- 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.

x is a 2-digit positive integer that is a multiple of 3, and the units digit of $3x$ is 7.

Quantity A

x

Quantity B

69

- 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.

Let n be a positive integer and let x and y be nonzero numbers. List Q consists of $2n$ values whose average (arithmetic mean) is $2x + y$. List R consists of $3n$ values whose average is $x + 2y$. The average of the $5n$ values in lists Q and R combined is $1.2x + 1.9y$.

Quantity A

$$\frac{x}{y}$$

Quantity B

$$1.5$$

- 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.

For a certain task, an office worker will be paid a total of s dollars for the first 20 hours worked plus t dollars for each hour worked in excess of 20 hours. Which of the following represents the total amount, in dollars, that the office worker will be paid for x hours worked, where x is an integer greater than 20?

- $s + tx$
- $20s + tx$
- $st(x - 20)$
- $s + t(x - 20)$
- $20s + t(x - 20)$

Select one answer choice.

Sphere K has radius k , and sphere N has radius n . If the ratio of the surface area of sphere K to the surface area of sphere N is 9 to 4, what is the ratio of k to n ? (Note: The surface area of a sphere of radius r is $4\pi r^2$.)

- 45 to 32
- 81 to 16
- 27 to 16
- 9 to 4
- 3 to 2

Select one answer choice.

If $0 \leq n \leq 1$ and $0 \leq p \leq 1$, which of the following statements must be true?

Indicate all such statements.

- $0 \leq n + p \leq 1$
- $-1 \leq n - p \leq 1$
- $0 \leq np \leq 1$

Select one or more answer choices.

Working at a constant rate, a certain irrigation system takes 3 days to water a level, circular field with a radius of 400 meters. Approximately what is the area, in square meters, of the part of the field that is watered each day?

- 120,000
- 160,000
- 170,000
- 250,000
- 500,000

Select one answer choice.

A certain vase holds 4,286 milliliters of water. If 1 milliliter of water weighs 1 gram, how many kilograms of water does the vase hold?

 kilograms

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

Questions 14 to 16 are based on the following data.

Population and Motor Vehicle Data for Selected States, 2001

State	Population (in thousands)	Number of Motor Vehicles per 1,000 People	Average Number of Miles Driven per Motor Vehicle	Average Number of Miles Driven per Gallon of Gasoline Used
Alaska	635	941	7,898	11.9
California	34,494	834	10,796	17.6
Florida	16,348	875	10,855	17.3
New Jersey	8,502	776	10,444	14.2
Texas	21,316	673	15,058	15.6

Notes:

- (1) Populations and numbers of motor vehicles registered are for the end of 2001.
- (2) Miles driven and gasoline used are for the entire year of 2001.

For the motor vehicles registered in Texas, approximately what was the average (arithmetic mean) number of miles driven per person in 2001 ?

- 10,000
- 15,000
- 22,000
- 26,000
- 30,000

Select one answer choice.

Questions 14 to 16 are based on the following data.

Population and Motor Vehicle Data for Selected States, 2001

State	Population (in thousands)	Number of Motor Vehicles per 1,000 People	Average Number of Miles Driven per Motor Vehicle	Average Number of Miles Driven per Gallon of Gasoline Used
Alaska	635	941	7,898	11.9
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New Jersey	8,502	776	10,444	14.2
Texas	21,316	673	15,058	15.6

Notes:

- (1) Populations and numbers of motor vehicles registered are for the end of 2001.
- (2) Miles driven and gasoline used are for the entire year of 2001.

For the total number of miles driven by the motor vehicles registered in Alaska in 2001, approximately how many gallons of gasoline were used?

- 40 million
- 56 million
- 400 million
- 4,000 million
- 5,600 million

Select one answer choice.

Questions 14 to 16 are based on the following data.

Population and Motor Vehicle Data for Selected States, 2001

State	Population (in thousands)	Number of Motor Vehicles per 1,000 People	Average Number of Miles Driven per Motor Vehicle	Average Number of Miles Driven per Gallon of Gasoline Used
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Texas	21,316	673	15,058	15.6

Notes:

- (1) Populations and numbers of motor vehicles registered are for the end of 2001.
- (2) Miles driven and gasoline used are for the entire year of 2001.

Registered motor vehicles consist of automobiles, buses, and trucks. In New Jersey at the end of 2001, if the number of registered automobiles was 2 times the total number of registered buses and trucks, how many automobiles were registered in New Jersey at the end of 2001 ?

Give your answer to the nearest 100,000.

 automobiles

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

The operation \star is defined by $x \star y = \frac{y}{x+1}$ for all numbers x and y , where $x \neq -1$. For what value of x is $x \star 1 = \frac{7}{10}$?

Give your answer as a fraction.

$$x = \frac{\boxed{}}{\boxed{}}$$

A1 GRE

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

The cover price of Magazine X is \$2.25 per copy. Last week, a total of n copies of Magazine X were sold, of which 60 percent were sold at the cover price and the rest were sold for 25 percent less than the cover price. What is the total revenue, in dollars, from sales of Magazine X last week, in terms of n ?

- 1.575 n
- 1.80 n
- 2.0 n
- 2.025 n
- 2.25 n

Select one answer choice.

A continuous random variable R has a mean of 60 and a standard deviation of 15. What is the value of R that is 0.5 standard deviation above the mean?

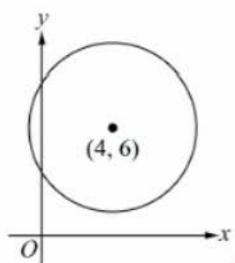
- 60.5
- 67.5
- 75
- 75.5
- 90

Select one answer choice.

The standard deviation of the values in a data set is 8. The least value in the data set is 3.25 standard deviations below the mean, and the greatest value in the data set is 4.5 standard deviations above the mean. What is the range of the values in the data set?

- 10
- 26
- 36
- 48
- 62

Select one answer choice.



(4, 6) is the center of the circle above.

Quantity A

The radius of the circle

Quantity B

6

- 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.

For each nonzero number x , the function g is defined by $g(x) = \frac{1-x}{x}$.

$$c < -2$$

Quantity A

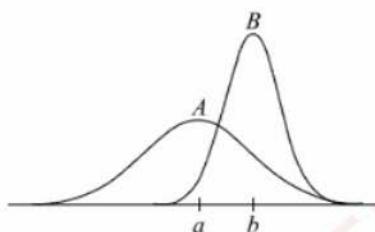
$$g(c)$$

Quantity B

$$g(-c)$$

- 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.



The figure shows two normal distributions, A and B , with means a and b , respectively.

Quantity A

The standard deviation of distribution A

Quantity B

The standard deviation of distribution B

- 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.

$$\begin{aligned}8k - 5m &= 15 \\2k + m &= 15\end{aligned}$$

Quantity A k Quantity B m

- 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.

a is a positive integer.

x is the remainder when $15a$ is divided by 6.

Quantity A

x

Quantity B

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.

Thirty percent of the members of Group G are also members of Group H . Twenty percent of the members of Group H are also members of Group G .

Quantity A

The total number of members of Group G

Quantity B

The total number of members of Group H

- 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.

The lengths of the three sides of triangle T are 9, 12, and 16.

Quantity A

The measure of the interior angle of T
opposite the side with length 16

Quantity B

90°

- 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.

$$\sqrt{y^2} = 8$$

Quantity A

$$3^{2y}$$

Quantity B

$$3^{-2y}$$

- 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.

At an art auction $\frac{1}{3}$ of the pictures were sold during the first hour and $\frac{1}{2}$ of the remaining pictures were sold during the second hour. What fraction of the pictures remained unsold at the end of the two hours?

 $\frac{3}{5}$ $\frac{2}{3}$ $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{6}$

Select one answer choice.

The average (arithmetic mean) of the numbers on a certain list is 30. Each of the numbers on the list is doubled and the result is then appended to the original list, producing a new list that contains twice as many numbers as the original. What is the average of the numbers on the new list?

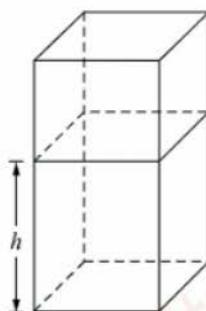
- 40
- 45
- 50
- 55
- 60

Select one answer choice.

Set M is composed of all 3-digit positive multiples of 7. What is the range of the numbers in set M ?

- 882
- 885
- 889
- 894
- 896

Select one answer choice.



The figure represents the interior of a rectangular tank with a volume of 175 cubic feet and a base area of 17.5 square feet. The tank contains 105.0 cubic feet of water, which fills the tank to a level of h feet above the bottom. The water level in the tank is to be raised 2.4 feet by adding water to the tank. The volume of additional water will be what fraction of the total volume of water in the tank after the water is added?

- $\frac{1}{3}$ $\frac{2}{5}$ $\frac{2}{7}$ $\frac{3}{5}$ $\frac{3}{4}$

Select one answer choice.

The Mountaineering Club has 90 members. If 50 percent of the members are 30 years old or younger and 20 percent of the members are 50 years old or older, how many of the members are older than 30 years and younger than 50 years?

 members

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

Questions 14 to 16 are based on the following data.



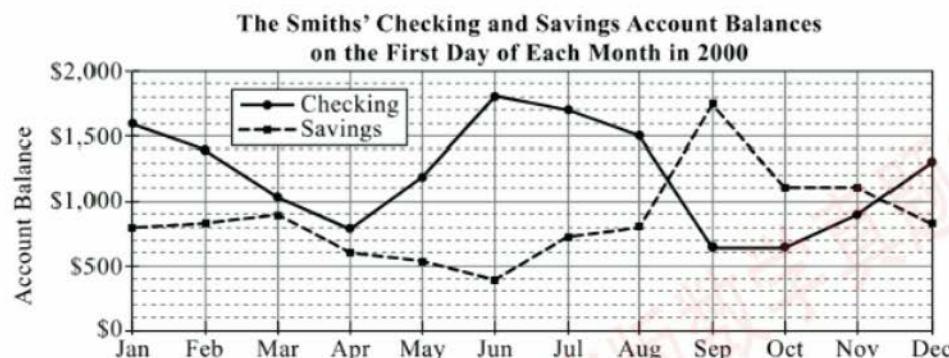
Note: The Smiths' total bank account balance is equal to the total of their checking account balance and their savings account balance.

The Smiths' checking account balance was greater than \$1,000 on the first day of how many months in 2000 ?

- Three
- Four
- Six
- Eight
- Nine

Select one answer choice.

Questions 14 to 16 are based on the following data.



Note: The Smiths' total bank account balance is equal to the total of their checking account balance and their savings account balance.

The Smiths' total bank account balance on January 1, 2000, was 1.5 times their total bank account balance on December 1, 1999. Their total bank account balance on December 1, 1999, was \$600 more than it was on November 1, 1999. If the Smiths' total bank account balance on November 1, 1999, was x dollars, then x satisfies which of the following equations?

- $1.5(x - 600) = 1,600$ $1.5(x + 600) = 1,600$ $1.5(x - 600) = 2,400$
- $1.5x + 600 = 2,400$ $1.5(x + 600) = 2,400$

Select one answer choice.

Questions 14 to 16 are based on the following data.

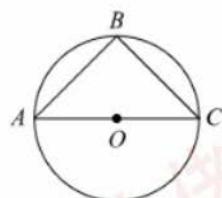


Note: The Smiths' total bank account balance is equal to the total of their checking account balance and their savings account balance.

The Smiths' total bank account balance increased by approximately what percent from April 1 to July 1, 2000 ?

- 25% 43% 57% 75% 113%

Select one answer choice.



In the figure above, the center of the circle is O and $AB = BC$. If the ratio of the area of triangle ABC to the area of semicircle ABC is x to π , what is the value of x ?

$$x = \boxed{\quad}$$

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

If x is an integer greater than 2, which of the following must be a positive number?

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

Select one answer choice.

One-half of 8^{150} is equal to which of the following?

- 2^{149}
- 2^{150}
- 2^{199}
- 2^{300}
- 2^{449}

Select one answer choice.

Brand	Price per Loaf	Number of Loaves Sold
A	\$4.00	12
B	\$2.00	n
C	\$1.00	8

The table above shows the prices of three brands of bread and the corresponding numbers of loaves sold yesterday at a local market. If the average (arithmetic mean) price per loaf of all the loaves sold yesterday was greater than \$2.50, which of the following could be the value of n ?

Indicate all such values.

- 7
- 9
- 11
- 13
- 15

Select one or more answer choices.

In triangle ABC the altitude from vertex B to side AC is of length h , and in triangle RST the altitude from vertex S to side RT is of length $h + r$, where $r > 0$. The areas of the two triangular regions are equal.

Quantity A

The length of side AC

Quantity B

The length of side RT

- 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.

n is a positive integer and $k = 10,000n$.

Quantity A

The sum of the digits of n

Quantity B

The sum of the digits of k

- 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.

The median of the five measurements in set X is 65 and the median of the five measurements in set Y is 75. All ten measurements in sets X and Y are between 60 and 80.

Quantity A

The median of the ten measurements in sets X and Y combined

Quantity B

70

- 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.

An area of 4 square yards is equal to an area of x square feet. (1 yard = 3 feet)

Quantity A

x

Quantity B

36

- 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.

$$r = (2^3)(3^4)(5^6)$$
$$s = (11^3)(13^4)(17^6)$$

Quantity AThe number of different positive factors of r Quantity BThe number of different positive factors of s

- 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.

$$x > 0$$

Quantity A

The area of a square region with diagonal of length $\sqrt{2} x$

Quantity B

The area of a circular region with diameter of length 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.

Quantity A

$$(1.5 + z)^2 - \frac{1}{4}$$

Quantity B

$$(1.25 + z)^2 + \frac{3}{4}$$

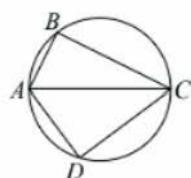
- Quantity A is greater.
- Quantity B is greater.
- The two quantities are equal.
- The relationship cannot be determined from the information given.

Select one answer choice.

Last Saturday a cyclist started a 40-kilometer trip at 9 o'clock in the morning and rode at an average speed of 20 kilometers per hour for 45 minutes. The cyclist stopped to rest for x minutes and then rode at an average speed of 30 kilometers per hour until the trip was completed at 11 o'clock in the morning. What is the value of x ?

- 35
- 25
- 20
- 15
- 10

Select one answer choice.



In the figure, quadrilateral $ABCD$ is inscribed in the circle and line segment AC is a diameter of the circle. The measure of angle BCD is x degrees, and the measure of angle BAD is y degrees. What is the value of y in terms of x ?

- $2x$
- $90 + x$
- $180 - x$
- $180 - 2x$
- $360 - 2x$

Select one answer choice.

An investor purchased two properties, A and B . The investor later sold property A at a selling price that was 20 percent more than the purchase price of A , and the investor sold property B at a selling price that was 40 percent less than the purchase price of B . If the combined purchase price of properties A and B was \$200,000 and the combined selling price was \$210,000, what was the selling price of property A ?

- \$160,000
- \$170,000
- \$180,000
- \$190,000
- \$200,000

Select one answer choice.

If $x = 2y + 1$, and $y = 2w$, where w , x , and y are integers, which of the following must be an odd integer?

- $xy + w$ $xy + w + 1$ $(x + y)w$ $wy + x$ $wx + y$

Select one answer choice.

$$S = \{1, 2, 3, 4, 6\}$$

$$T = \{1, 2, 3, 6, 8\}$$

From set S , an integer is chosen and called s , and from set T an integer is chosen and called t . The product of the two integers s and t is called p . What is the total number of different values of p that can be determined in this way?

- 5
- 9
- 14
- 18
- 25

Select one answer choice.

A local store combined two consecutive discounts into a single discount. If the two consecutive discounts were 20 percent off the retail price and then 40 percent off the discounted price, what is the single discount off the retail price that is equivalent to the two consecutive discounts?

 %

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

Section 6 of 6 | Question 14 of 20

00:34:16 ⏳ Hide Time

Questions 14 to 16 are based on the following data.



In what percent of the games for which the difference in the number of points scored by the two teams was equal to 1 point did team A score more than team B?

- 20%
- 30%
- $33\frac{1}{3}\%$
- 50%
- $66\frac{2}{3}\%$

Select one answer choice.

Section 6 of 6 | Question 15 of 20

00:34:14 ⏳ Hide Time

Questions 14 to 16 are based on the following data.



Two of the ten games will be selected at random, without replacement. What is the probability that both of the games selected will be games in which team *A* scored more points than team *B*?

- $\frac{2}{9}$
- $\frac{1}{4}$
- $\frac{5}{18}$
- $\frac{1}{3}$
- $\frac{1}{2}$

Select one answer choice.

Section 6 of 6 | Question 16 of 20

00:34:12 ⏳ Hide Time

Questions 14 to 16 are based on the following data.



The number of games in which team *B* scored at least 50 percent more points than team *A* was what fraction of the number of games in which team *B* scored more points than team *A*?

- $\frac{1}{5}$
- $\frac{2}{5}$
- $\frac{1}{2}$
- $\frac{3}{5}$
- $\frac{4}{5}$

Select one answer choice.

x	5	3	1	-1
$f(x)$	-7	-3	1	5

The table above shows the values of $f(x)$ for selected values of x , where $f(x)$ is a linear function. What is the value of $f(-10)$?

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

For all integers x greater than 1, the function $p(x)$ is defined as the number of different prime factors of x .

What is the value of $\frac{p(12)}{p(9)}$?

- $\frac{2}{3}$
- $\frac{4}{3}$
- $\frac{3}{2}$
- 2
- 3

Select one answer choice.

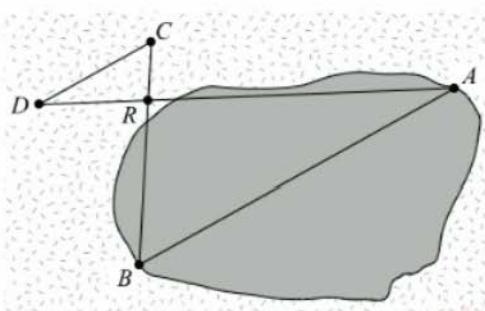
-14, -11, -7, 9, 10, 13

Which of the following statements are true for the list of six numbers above?

Indicate all such statements.

- The standard deviation is greater than the median.
- The range is greater than the median.
- The product of the six numbers is negative.

Select one or more answer choices.



The figure above represents a pond and the nearby land that surrounds it. Lucia plans to measure the distance across the pond from point A to point B . First, she will measure the distance from a rock on land at point R to point D on line AR . Next, she will measure the distance, along a line parallel to line AB , from point D to point C , which lies on line BR . Of the following, which additional measurement will be sufficient to determine the distance from A to B ?

- The distance from A to R
- The distance from B to R
- The distance from C to R
- The measure of angle ARB
- The measure of angle DAB

Select one answer choice.

Of the students in class M , 2 percent dropped the class. Of the students in class N , 8 percent dropped the class.

Quantity A

The number of students that dropped class M

Quantity B

The number of students that dropped class N

- 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.

$$2x + 1 = 9$$

Quantity A x Quantity B

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.

$x > 0$ and $y < 0$ Quantity A

$$xy$$

Quantity B

$$y^2$$

- 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.

$$\frac{x+y}{2} = 5 \text{ and } \frac{x+y+z}{3} = 4$$

Quantity A z Quantity B

3

- 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.

The random variables A and B are each normally distributed, where A has a mean of 3 and a standard deviation of 2, and B has a mean of 5 and a standard deviation of 1.

Quantity A

The percent of the values of A that are between 4 and 6

Quantity B

The percent of the values of B that are between 4 and 6

- 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.

Each of the lists S and T consists of 5 numbers. For each integer k from 1 to 5, the k th number in list S is $3k - 1$ and the k th number in list T is $2k + 17$.

Quantity A

The standard deviation of the numbers in list S

Quantity B

The standard deviation of the numbers in list T

- 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.

$$x < x^3 < x^2$$

Quantity A

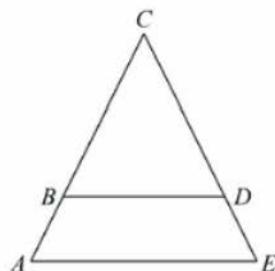
$$x^5$$

Quantity B

$$x^7$$

- 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.



In the figure above, triangle ACE is similar to triangle BCD . The height of ACE corresponding to the base AE is 7, and the height of BCD corresponding to the base BD is k . The area of BCD is equal to the area of trapezoid $ABDE$.

Quantity A

k

Quantity B

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.

A list consists of six distinct positive integers less than or equal to 10. Which of the following CANNOT be the median of the six integers?

- 3
- 4
- 5.5
- 6
- 7.5

Select one answer choice.

When the positive integer m is divided by 5, the remainder is 2. Which of the following integers could be the remainder when m is divided by 15?

Indicate all such integers.

- 2
- 5
- 7
- 8
- 10
- 12

Select one or more answer choices.

In a certain trivia game, each contestant answers 20 questions and earns or loses points as follows. The contestant earns 10 points for each correct answer and loses 2 points for each incorrect answer. If the contestant begins the game with 0 points, which of the following CANNOT be the total number of points that the contestant has after answering the 20 questions?

- 80
- 104
- 124
- 140
- 152

Select one answer choice.

In triangle ABC , the length of side AB is 13, the length of side BC is 14, and the length of side AC is 15. What is the length of the altitude from vertex A to side BC ?

- 10
- 10.5
- 11
- 11.5
- 12

Select one answer choice.

In the xy -plane, what is the x -intercept of the line $12x + 3y = 8$?

Give your answer as a fraction.

<input type="text"/>
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A1 GRE

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

Questions 14 to 16 are based on the following data.

Population and Motor Vehicle Data for Selected States, 2001

State	Population (in thousands)	Number of Motor Vehicles per 1,000 People	Average Number of Miles Driven per Motor Vehicle	Average Number of Miles Driven per Gallon of Gasoline Used
Alaska	635	941	7,898	11.9
California	34,494	834	10,796	17.6
Florida	16,348	875	10,855	17.3
New Jersey	8,502	776	10,444	14.2
Texas	21,316	673	15,058	15.6

Notes:

- (1) Populations and numbers of motor vehicles registered are for the end of 2001.
- (2) Miles driven and gasoline used are for the entire year of 2001.

At the end of 2001, approximately how many more motor vehicles were registered in California than in Texas?

- 160,000
- 2,100,000
- 8,900,000
- 11,000,000
- 14,400,000

Select one answer choice.

Questions 14 to 16 are based on the following data.

Population and Motor Vehicle Data for Selected States, 2001

State	Population (in thousands)	Number of Motor Vehicles per 1,000 People	Average Number of Miles Driven per Motor Vehicle	Average Number of Miles Driven per Gallon of Gasoline Used
Alaska	635	941	7,898	11.9
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Florida	16,348	875	10,855	17.3
New Jersey	8,502	776	10,444	14.2
Texas	21,316	673	15,058	15.6

Notes:

- (1) Populations and numbers of motor vehicles registered are for the end of 2001.
- (2) Miles driven and gasoline used are for the entire year of 2001.

At the end of 2001, which of the following states had the median number of motor vehicles registered for the five states shown?

- Alaska
- California
- Florida
- New Jersey
- Texas

Select one answer choice.

Questions 14 to 16 are based on the following data.

Population and Motor Vehicle Data for Selected States, 2001

State	Population (in thousands)	Number of Motor Vehicles per 1,000 People	Average Number of Miles Driven per Motor Vehicle	Average Number of Miles Driven per Gallon of Gasoline Used
Alaska	635	941	7,898	11.9
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Florida	16,348	875	10,855	17.3
New Jersey	8,502	776	10,444	14.2
Texas	21,316	673	15,058	15.6

Notes:

- (1) Populations and numbers of motor vehicles registered are for the end of 2001.
 (2) Miles driven and gasoline used are for the entire year of 2001.

At the end of 2017, the population of Texas was 34 percent greater than the population of Florida.

Which of the following statements individually provide(s) sufficient additional information to conclude that at the end of 2017 the population of Florida was less than 21 million?

Indicate all such statements.

- At the end of 2017, the population of Texas exceeded the population of Florida by less than 7 million.
- From the end of 2001 to the end of 2017, the population of Texas increased by more than 6 million.
- From the end of 2001 to the end of 2017, the population of Texas increased by less than 8 million.

Select one or more answer choices.

On January 1 Rahul deposited \$1,000 into a savings account that pays interest at an annual rate of 2 percent, compounded annually, and \$4,000 into a savings account that pays interest at an annual rate of 3 percent, compounded annually. The total amount of interest paid by the two accounts at the end of the first year will be what percent of the total amount that Rahul deposited into the two accounts?

 %

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

Three concentric circles form the boundaries of the three sections of a certain garden: an innermost circular section, a middle ring-shaped section, and an outermost ring-shaped section. The area of the outermost section is 5 times the area of the middle section. If the radii of the two smaller circles are 10 meters and 30 meters, what is the radius, in meters, of the largest circle?

- 63
- 67
- 70
- 75
- 150

Select one answer choice.

Let S be the set of integers from 1 to 10. How many subsets of S contain at least one even integer and at least one odd integer?

- 25
- 31
- 62
- 252
- 961

Select one answer choice.

Working alone at their respective constant rates, pumps A , B , and C can fill a certain empty swimming pool with water in 3 hours, 4.5 hours, and 12 hours, respectively. Pumps A and B began working simultaneously to fill the empty pool. Pump B stopped working at the same time that pump C started working to fill the pool. If the empty pool was filled in 2 hours, in how many minutes after pump B stopped working was the pool filled?

- 40
- 48
- 60
- 66
- 80

Select one answer choice.

$$k > 0 \text{ and } m < 0$$

Quantity A

$$|-k + m|$$

Quantity B

$$k - m$$

- 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.

The average (arithmetic mean) of 20 numbers is 53. When one of the numbers is discarded, the average (arithmetic mean) of the remaining numbers is 54.

Quantity A

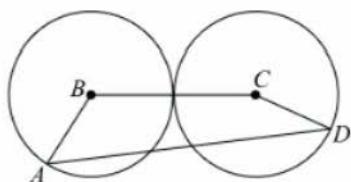
The discarded number

Quantity B

50

- 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.



The two circles have centers at B and C , respectively, and are mutually tangent. Each circle has radius r .

Quantity A

The perimeter of quadrilateral $ABCD$

Quantity B

$8r$

- 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.

$$x^2 \neq 1$$

Quantity A

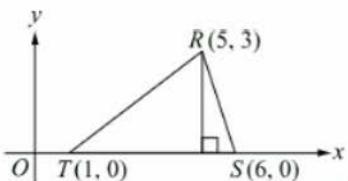
$$\frac{1}{x-1} - \frac{1}{x+1}$$

Quantity B

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

- 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.



The figure shows triangle TRS in the xy -plane.

Quantity A

The length of TR

Quantity B

The length of TS

- 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.

m is an odd integer greater than 1.

Quantity A

The greatest prime factor of $2m$

Quantity B

The greatest prime factor of m^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.

x is an integer greater than 3.

Quantity A

The number of even factors of $2x$

Quantity B

The number of odd factors of $3x$

- 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.

A total of 500 tickets to a play were sold at prices ranging from \$20 to \$100 each. The average (arithmetic mean) price per ticket was \$60.

Quantity A

The number of tickets sold for at most \$60 each

Quantity B

The number of tickets sold for at least \$60 each

- 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.

A dog show features four breeds consisting of 3 poodles, 3 German shepherds, 3 boxers, and 2 Irish setters. If the winning group will consist of one dog from each breed, how many different winning groups are possible?

- 11
- 20
- 44
- 54
- 432

Select one answer choice.

If x is an integer and the sides of a triangle are $x + 3$, $2x$, and $x + 5$, respectively, which of the following could NOT be the perimeter of the triangle?

- 16
- 20
- 28
- 30
- 32

Select one answer choice.

The cost C , in dollars, to remove p percent of a certain pollutant from a lake is estimated by using the formula $C = \frac{500,000p}{100 - p}$. According to this estimate, how much more would it cost to remove 99 percent of the pollutant than it would cost to remove 90 percent?

- \$50,000
- \$500,000
- \$4,500,000
- \$45,000,000
- \$450,000,000

Select one answer choice.

Set M consists of all the different integers n that satisfy $|n - 5| < 3$. What is the median of the numbers in set M ?

- 3.5
- 4
- 4.5
- 5
- 5.5

Select one answer choice.

In a group of 100 adults, each owns a DVD player, a CD player, or both. If 60 adults own a DVD player and 70 adults own a CD player, how many adults own both?

A1_GRE

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

Section 4 of 6 | Question 14 of 20

00:34:25 ⏳ Hide Time

Questions 14–16 are based on the following data.

Fifty government officials rated 12 proposals for a public works program. Each proposal received an individual rating of 1, 2, 3, 4, 5, 6, or 7 from each official. For each proposal, the sum of the 50 ratings and the median rating are listed in the table below.

Summary Data for Proposal Ratings

Proposal Number	Sum of 50 Ratings	Median Rating
1	164	3.0
2	125	3.0
3	311	6.0
4	229	5.0
5	252	4.5
6	232	4.0
7	303	6.0
8	95	2.0
9	130	3.0
10	236	4.0
11	204	4.0
12	263	5.5

Approximately what percent of the proposals have a median rating of 4.0 or less?

- 33%
- 42%
- 50%
- 58%
- 70%

Select one answer choice.

Section 4 of 6 | Question 15 of 20

00:34:23 Hide Time

Questions 14–16 are based on the following data.

Fifty government officials rated 12 proposals for a public works program. Each proposal received an individual rating of 1, 2, 3, 4, 5, 6, or 7 from each official. For each proposal, the sum of the 50 ratings and the median rating are listed in the table below.

Summary Data for Proposal Ratings

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6	232	4.0
7	303	6.0
8	95	2.0
9	130	3.0
10	236	4.0
11	204	4.0
12	263	5.5

For proposal number 2, the average (arithmetic mean) rating is how much greater or less than the median rating?

- 0.5 greater
- 2.5 greater
- 0.5 less
- 2.5 less
- Neither greater nor less

Select one answer choice.

Section 4 of 6 | Question 16 of 20

00:34:21 Hide Time

Questions 14–16 are based on the following data.

Fifty government officials rated 12 proposals for a public works program. Each proposal received an individual rating of 1, 2, 3, 4, 5, 6, or 7 from each official. For each proposal, the sum of the 50 ratings and the median rating are listed in the table below.

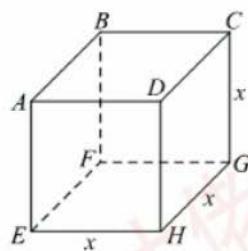
Summary Data for Proposal Ratings

Proposal Number	Sum of 50 Ratings	Median Rating
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2	125	3.0
3	311	6.0
4	229	5.0
5	252	4.5
6	232	4.0
7	303	6.0
8	95	2.0
9	130	3.0
10	236	4.0
11	204	4.0
12	263	5.5

How many of the proposals must have received at least one rating of 5, 6, or 7?

- Four
- Five
- Six
- Seven
- Eight

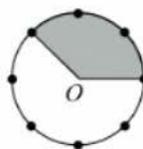
Select one answer choice.



The cube shown above has edges of length x , where x is an integer. The length of diagonal AG (not shown) is 10.39, to the nearest 0.01. What is the value of the integer x ?

$$x = \boxed{}$$

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



The circle above has center O and circumference 16π . If the eight points indicated on the circle are equally spaced, what is the perimeter of the shaded region?

- $8 + 4\pi$ $8 + 6\pi$ $16 + 4\pi$ $16 + 6\pi$ $16 + 8\pi$

Select one answer choice.

Eugene and Penny started a job in sales on the same day. Eugene's sales for the first month were r dollars, and each month after the first his sales for that month were twice his sales for the preceding month. Penny's sales for the first month were $10r$ dollars, and each month after the first her sales for that month were $10r$ dollars more than her sales for the preceding month. Which of the following statements are true?

Indicate all such statements.

- The dollar amount of Penny's sales for the second month was 10 times that of Eugene's sales for that month.
- The dollar amount of Penny's sales for the fourth month was 5 times that of Eugene's sales for that month.
- The dollar amount of Eugene's sales for the eighth month was greater than that of Penny's sales for that month.

Select one or more answer choices.

$$(2.82 \times 10^{-51}) - (3.96 \times 10^{-49}) =$$

- -3.9318×10^{-49}
- -1.7804×10^{-51}
- -1.14×10^{-100}
- 1.7804×10^{-51}
- 3.9318×10^{-49}

Select one answer choice.

The median of 35 measurements is 18.

Quantity A

The sum of the 35 measurements

Quantity B

625

- 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.

-8, -3, 5, 8, 3, 5, ...

In the sequence, each term after the first two terms is the absolute value of the difference of the two preceding terms.

Quantity A

The first number to occur three times in the sequence

Quantity B

3

- 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.

A bowl contains jelly beans, 10 percent of which are green and the rest are blue. To this bowl n green jelly beans and $10n$ blue jelly beans will be added, where $n > 0$.

Quantity A

After the $11n$ jelly beans are added to the bowl, the percent of the jelly beans in the bowl that will be green

Quantity B

10%

- 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.

The reciprocal of $x - 2$ is $x + 2$.

Quantity A

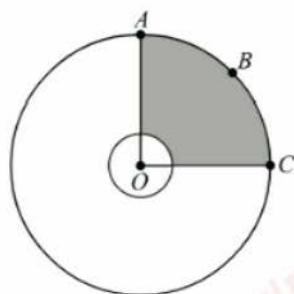
x

Quantity B

3

- 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.



The two circles in the figure shown have a common center at O , the area of the shaded region is 40π , and the measure of angle AOC is 90° .

Quantity A

The circumference of the smaller circle

Quantity B

The length of arc ABC

- 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.

a and b are negative, and $(a + b)(a - b) < 0$.

Quantity A

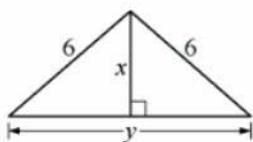
a

Quantity B

b

- 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.

Quantity A

$$4x^2 + y^2$$

Quantity B

$$144$$

- 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.

On each of 3 tests Tina received a score between 0 and 100, inclusive. If her average (arithmetic mean) score on the tests was 75, what is the greatest possible difference between her highest and lowest test scores?

- 30
- 40
- 50
- 60
- 75

Select one answer choice.

Which of the following statements are true for all integers a and b ?

Indicate all such statements.

- $(-1)^{ab} = (-1)^a(-1)^b$
- $(-1)^{a+b} = (-1)^a + (-1)^b$
- $(-1)^{a+b} = (-1)^a(-1)^b$

Select one or more answer choices.

$$(5^3)w + (5^2)x + 5y + z = 264$$

In the equation shown, w , x , y , and z are nonnegative integers and each is less than 5. What is the value of $w + x + y + z$?

- 5
- 6
- 8
- 10
- 12

Select one answer choice.

Color	Number of Cards	Labels
Red	3	K, S, W
Blue	3	S, W, H
Green	3	W, H, N

In a set of cards, each card is colored one of three colors and each card is labeled with one letter as indicated in the table. If one card is to be selected at random from the set, what is the probability that the selected card will be blue or labeled with the letter *W*?

- $\frac{2}{9}$ $\frac{3}{9}$ $\frac{4}{9}$ $\frac{5}{9}$ $\frac{6}{9}$

Select one answer choice.

The area of rectangular region R is 50 percent greater than the area of rectangular region S . If the length of R is 25 percent greater than the length of S , then the width of R is what percent greater than the width of S ?

- 20%
- 25%
- 75%
- 120%
- 125%

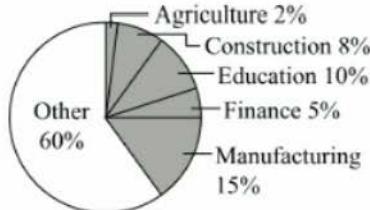
Select one answer choice.

When an even integer k is rounded to the nearest 10, the result is 530. What is the greatest possible value of k ?

A1_GRE

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

Questions 14 to 16 are based on the following data.

Employment in Region X by Sector of the Economy**Percent Distribution of People Currently Employed****Predicted Changes in Number of People Employed According to Projection A and Projection B**

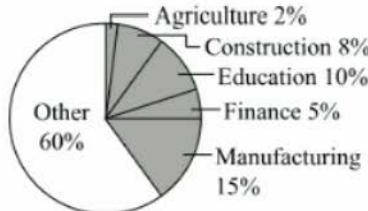
Sector of Economy	Projection A	Projection B
Agriculture	+10,000	+5,000
Construction	+20,000	+10,000
Education	-5,000	+15,000
Finance	+5,000	+20,000
Manufacturing	+15,000	-5,000

The number of people currently employed in agriculture is what percent of the total number of people currently employed in the five sectors shaded in the graph?

 2% 2.5% 5% 10% 40%

Select one answer choice.

Questions 14 to 16 are based on the following data.

Employment in Region X by Sector of the Economy**Percent Distribution of People Currently Employed****Predicted Changes in Number of People Employed According to Projection A and Projection B**

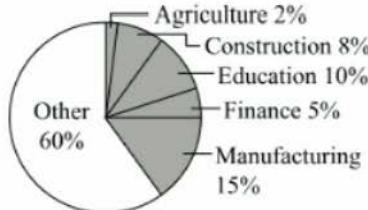
Sector of Economy	Projection A	Projection B
Agriculture	+10,000	+5,000
Construction	+20,000	+10,000
Education	-5,000	+15,000
Finance	+5,000	+20,000
Manufacturing	+15,000	-5,000

If the average (arithmetic mean) annual salary of the people currently employed in agriculture is \$35,000 and if the average annual salary of the people currently employed in construction is \$45,000, what is the average annual salary of the people currently employed in agriculture and construction combined?

 \$37,500 \$40,000 \$40,500 \$42,500 \$43,000

Select one answer choice.

Questions 14 to 16 are based on the following data.

Employment in Region X by Sector of the Economy**Percent Distribution of People Currently Employed****Predicted Changes in Number of People Employed According to Projection A and Projection B**

Sector of Economy	Projection A	Projection B
Agriculture	+10,000	+5,000
Construction	+20,000	+10,000
Education	-5,000	+15,000
Finance	+5,000	+20,000
Manufacturing	+15,000	-5,000

If the predicted change, according to projection A, in the number of people employed in education is a 4 percent decrease, then the predicted change, according to projection B, in the number of people employed in finance is what percent increase?

 %

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

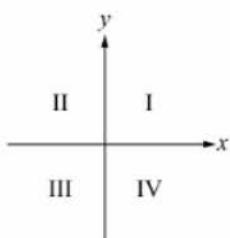
Michael, Kim, Glenda, and Ian all own DVDs, and no DVD is owned by two or more of them. Michael owns $\frac{1}{2}$ of the number of DVDs that Kim owns. Glenda owns $\frac{1}{3}$ of the number of DVDs that Ian owns. If Kim and Ian own the same number of DVDs, what is the ratio of the total number of DVDs that Michael and Glenda own to the total number of DVDs that Kim and Ian own?

Give your answer as a fraction.

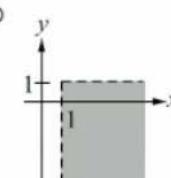
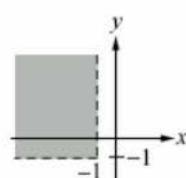
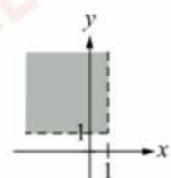
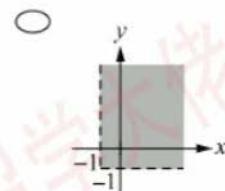
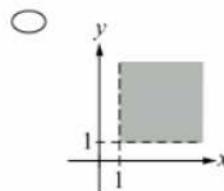
<input type="text"/>
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<input type="text"/>

A1 GRE

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



Which of the following shaded regions represents the set of all points (a, b) in the xy -plane above such that $(a + 1, b + 1)$ is in quadrant I? (Note that a point on an axis is not in any quadrant.)



Select one answer choice.

A certain list has 5 entries and each entry is an integer between 55 and 70, inclusive. The median of the 5 entries is 60. If m is the average (arithmetic mean) of the 5 entries, which of the following must be true?

- $54 \leq m \leq 60$
- $55 \leq m \leq 61$
- $56 \leq m \leq 62$
- $57 \leq m \leq 63$
- $58 \leq m \leq 64$

Select one answer choice.

A total of 600 tickets were sold for a play. The prices of the tickets were \$5 for children, \$6 for senior citizens, and \$7 for all other adults. The number of tickets sold for children was twice the number sold for adults who were not senior citizens. If the total receipts from the ticket sales were \$3,425, how many tickets were sold to senior citizens?

- 75
- 150
- 175
- 225
- 350

Select one answer choice.

Out of every 8 cars produced by a certain manufacturer, 3 are white.

Quantity A

The percent of the manufacturer's cars that are white

Quantity B

The percent of the manufacturer's cars that are black

- 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.

$$\frac{1}{5} = \frac{y}{3}$$

Quantity A y Quantity B

6

- 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.

31, -2, 79, 34, -47, 1, -25

Quantity A

The product of the numbers shown

Quantity B

The sum of the numbers shown

- 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.

$mn = 7$ and $m = 3$.Quantity A

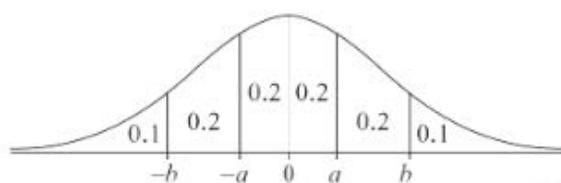
$$m(2n + 1)$$

Quantity B

15

- 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.



The figure shows a normal distribution with mean 0, including probabilities corresponding to the six intervals shown.

The random variable X has the distribution shown, and $a < t < b$.

Quantity A

$$P(X < t)$$

Quantity B

$$0.8$$

- 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.

Quantity A

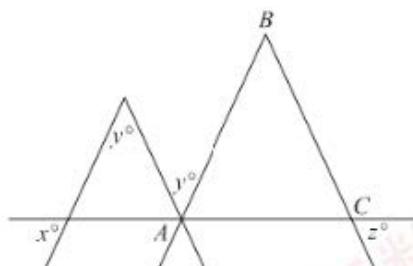
The median of the consecutive integers from 4 to 88, inclusive

Quantity B

46.5

- 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.



In the figure above, $AB > BC$.

Quantity A

x

Quantity B

z

- 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.

$x = (8q)^n$, where q and n are integers greater than 5 and q is odd.

Quantity A

The ratio of the number of odd positive factors of x to the number of even positive factors of x

Quantity B

$$\frac{1}{3n}$$

- 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.

If n and $1.25n$ are positive integers, which of the following could be the units digit of n ?

Indicate all such digits.

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

Select one or more answer choices.

A cyclist traveled a distance of 50 miles in 5 hours. The cyclist's average speed for the first 25 miles was 10 miles per hour faster than the cyclist's average speed for the last 25 miles. Which of the following is closest to the time, in hours, that it took the cyclist to travel the last 25 miles?

- 2.0
- 2.5
- 3.0
- 3.5
- 4.0

Select one answer choice.

In the xy -plane, a quadrilateral has vertices at the points $(1, 1)$, $(7, 2)$, $(5, 6)$, and $(2, 6)$. What is the area of the quadrilateral?

- 11
- 17.5
- 18
- 20
- 20.5

Select one answer choice.

A chemist mixed a solution that is 5 percent acid, by weight, with a second solution that is 20 percent acid, by weight, to produce x grams of a solution that is 12 percent acid, by weight. How many grams of the second solution did the chemist use to produce the mixture, in terms of x ?

- $\frac{7}{15}x$ $\frac{8}{15}x$ $\frac{7}{12}x$ $\frac{3}{5}x$ $\frac{2}{3}x$

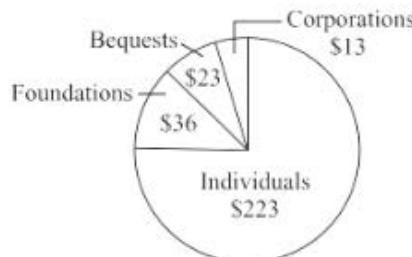
Select one answer choice.

Kelly deposited \$1,200 into a savings account that paid interest at a simple annual interest rate of 4 percent. If Kelly made no additional deposits to or withdrawals from the account, how much money was in the account at the end of one year, after the interest had been paid?

\$

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

Questions 14 to 16 are based on the following data.

Charitable Donations in Country C in 2017**Total: \$295 million****Amount Donated by Source (in millions)****Amount Received by Category**

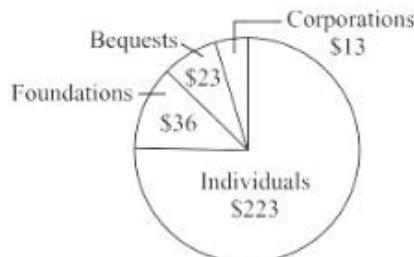
Category	Amount Received (in millions)
Religion	\$97
Education	\$41
Human Services	\$30
Public and Society	\$21
Health	\$20
Arts and Humanities	\$13
Other	\$73

If the amount donated to the Religion category by Individuals was donated by a total of 2 million people and if 82 percent of the amount received by the Religion category was donated by Individuals, approximately what was the average (arithmetic mean) amount donated to the Religion category per person for all the people who donated as Individuals?

 \$40 \$60 \$80 \$100 \$120

Select one answer choice.

Questions 14 to 16 are based on the following data.

Charitable Donations in Country C in 2017**Total: \$295 million****Amount Donated by Source (in millions)****Amount Received by Category**

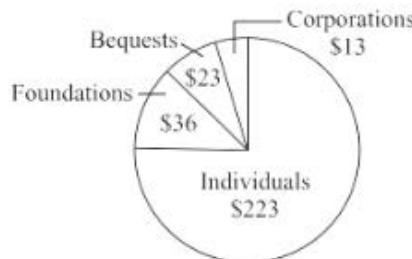
Category	Amount Received (in millions)
Religion	\$97
Education	\$41
Human Services	\$30
Public and Society	\$21
Health	\$20
Arts and Humanities	\$13
Other	\$73

The amount donated by Corporations was approximately what percent less than the total amount donated by Bequests and Foundations?

 22% 46% 54% 70% 78%

Select one answer choice.

Questions 14 to 16 are based on the following data.

Charitable Donations in Country C in 2017**Total: \$295 million****Amount Donated by Source (in millions)****Amount Received by Category**

Category	Amount Received (in millions)
Religion	\$97
Education	\$41
Human Services	\$30
Public and Society	\$21
Health	\$20
Arts and Humanities	\$13
Other	\$73

If the amounts donated by Foundations to the 7 categories shown were in the same proportion as the total amounts donated to the 7 categories, which of the following categories received more than \$3 million in donations from Foundations?

Indicate all such categories.

 Religion Education Human Services Public and Society Health Arts and Humanities Other

Select one or more answer choices.

If x is positive and satisfies $\frac{4}{x} = 3 + 7x$, what is the value of x ?

Give your answer as a fraction.

$$x = \frac{\boxed{}}{\boxed{}}$$

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

A water storage container has the shape of a right circular cone positioned so that its base is at the top and is horizontal. The interior height of the cone is 60 centimeters. Water is filling the container at a constant rate. If it takes 168 seconds for the height of the water to increase from 20 centimeters to 40 centimeters, how many seconds does it take for the height of the water to increase from 40 centimeters to 60 centimeters?

(Note: The volume V of a right circular cone is given by $V = \frac{1}{3}\pi r^2 h$, where r is the radius of the base and h is the height of the cone.)

- 168
- 252
- 456
- 480
- 567

Select one answer choice.

The variance of n values $x_1, x_2, x_3, \dots, x_n$ with mean \bar{x} is equal to $\frac{S}{n}$, where S is the sum of the squared differences $(x_i - \bar{x})^2$ for $1 \leq i \leq n$.

Data set R consists of n values and data set T consists of $2n$ values, where n is a positive integer. The means of the values in R and T are the same, and the variances of the values in R and T are 16 and 100, respectively. What is the variance of the values in the data set that consists of the values in R and the values in T ?

- 72
- 64
- 58
- 49
- 44

Select one answer choice.

For any subset S of a universal set U , the set \bar{S} consists of all the elements in U that are not in S . Of the elements in U , 50 percent are in set A , 30 percent are in set B , and 10 percent are in the set $A \cap B$. If the set $A \cup \bar{B}$ contains 840 elements, how many elements does the set $\bar{A} \cup B$ contain?

- 420
- 504
- 630
- 1,120
- 1,680

Select one answer choice.

$$a > 1$$

Quantity A

$$\frac{a}{a-1}$$

Quantity B

$$\frac{a+1}{a}$$

- 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.

When the positive number k is multiplied by itself, the result is $\frac{1}{2}$ of k .

Quantity A

k

Quantity B

$\frac{1}{4}$

- 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.

In the xy -plane, line l is perpendicular to the line determined by the equation $5y + 3x = 1$.

Quantity A

The slope of line l

Quantity B

$\frac{5}{3}$

- 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.

a and b are consecutive positive integers and a is less than b .

Quantity A

$$a^b$$

Quantity B

$$b^a$$

- 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.

n is an integer and $5n - 1$ is a positive even integer.

Quantity A

$$(-1)^{n+1}$$

Quantity B

1

- 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.

In a department of 15 employees, the average (arithmetic mean) annual salary of the 7 lowest-paid employees is \$33,500, and the average annual salary of the 7 highest-paid employees is \$38,000.

Quantity A

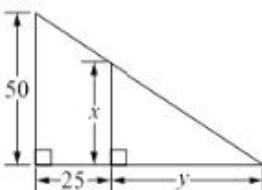
The median of the 15 annual salaries

Quantity B

\$35,900

- 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.

Quantity A x Quantity B y

- 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.

A set consists of k consecutive integers, including 2. The sum of the integers in the set is -11.

Quantity A

k

Quantity B

10

- 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.

$$\begin{aligned}M &= \{6, 27, 15, 8\} \\P &= \{-1, 0, 5, -12, 3\}\end{aligned}$$

For sets M and P above, \overline{M} is the set of numbers obtained by adding 3 to each number in M , and \overline{P} is the set of numbers obtained by adding 7 to each number in P . How much greater is the range of the numbers in \overline{M} than the range of the numbers in \overline{P} ?

- 0
- 1
- 2
- 3
- 4

Select one answer choice.

Stores A, B, C, and D sell a certain model of printer for the same retail price. The retail price of the printer is discounted by 10 percent, 20 percent, 16 percent, and 12 percent at Stores A, B, C, and D, respectively. If the retail price of the printer is at least \$100, which of the following statements about the discounted prices at the four stores must be true?

Indicate all such statements.

- The range is at least \$10.
- The median is at least \$90.
- The average (arithmetic mean) is at least \$80.

Select one or more answer choices.

In a certain raffle, the probability that the first ticket randomly drawn from the box will be a first-prize ticket is 0.001, and the probability that it will be a second-prize ticket is 0.005. If there are no other prizes, how many of the 1,000 tickets in the raffle box do not represent a prize?

- 994
- 995
- 996
- 997
- 998

Select one answer choice.

Martha invested a total of \$10,000, part at 8 percent simple annual interest and the remainder at 10 percent simple annual interest. If these investments yielded a total of \$870 in interest for one year, what amount had Martha invested at 8 percent simple annual interest?

- \$4,500
- \$5,500
- \$6,000
- \$6,500
- \$7,000

Select one answer choice.

Sam, Jan, and Kate all bought the same style of jacket. Jan paid 17 percent more for the jacket than Sam paid, and Kate paid 12 percent more for the jacket than Jan paid. The amount that Kate paid was what percent greater than the amount that Sam paid?

Give your answer to the nearest whole percent.

 %

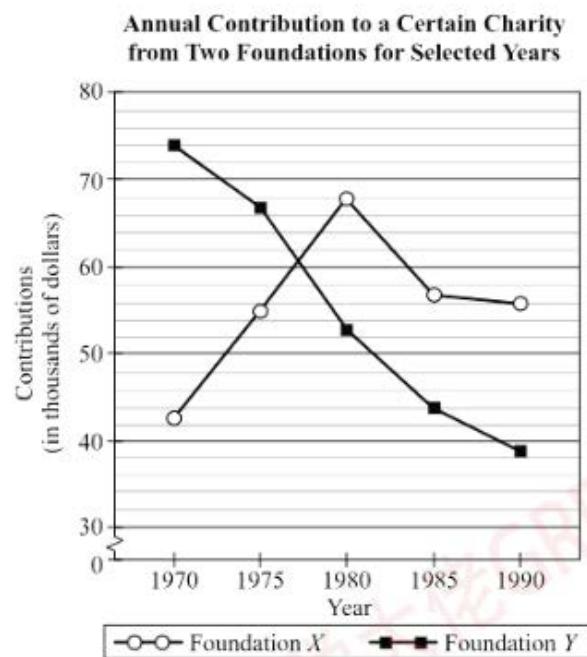
A1_GRE

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

Section 4 of 6 | Question 14 of 20

00:34:39 ⏱ Hide Time

Questions 14 to 16 are based on the following data.



In 1970 the annual contribution to the charity from Foundation X was closest to what percent of the annual contribution from Foundation Y ?

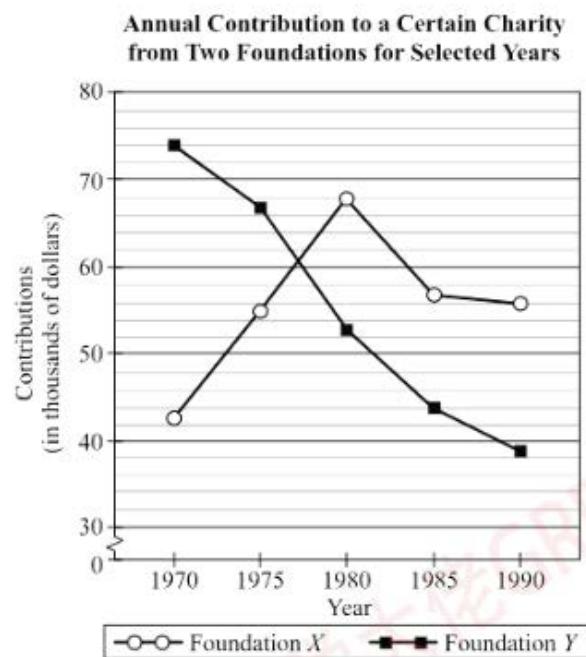
- 29%
- 31%
- 43%
- 58%
- 64%

Select one answer choice.

Section 4 of 6 | Question 15 of 20

00:33:40 Hide Time

Questions 14 to 16 are based on the following data.



Which of the following is closest to the range, in dollars, of the annual contributions to the charity from Foundation *X* for the five years shown?

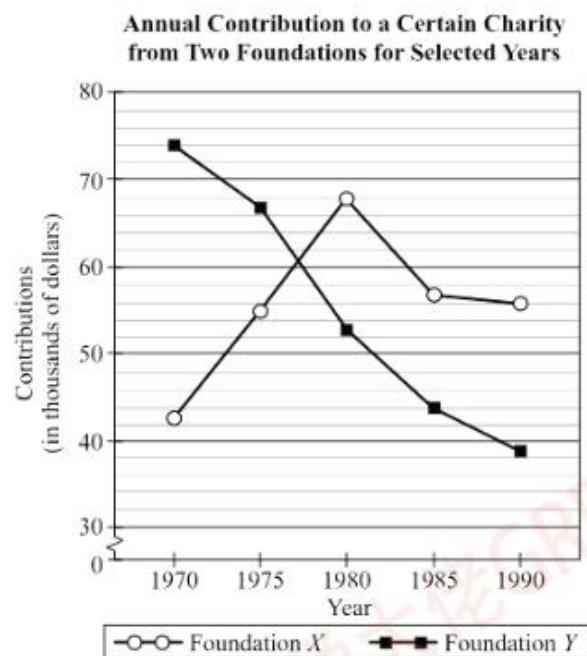
- \$13,000
- \$19,000
- \$25,000
- \$31,000
- \$35,000

Select one answer choice.

Section 4 of 6 | Question 16 of 20

00:33:39 ⏳ Hide Time

Questions 14 to 16 are based on the following data.



The ratio of the annual contribution to the charity from Foundation X to the annual contribution from Foundation Y was greatest in which of the following years?

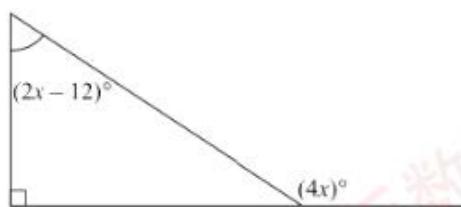
- 1970
- 1975
- 1980
- 1985
- 1990

Select one answer choice.

The sequence $a_1, a_2, a_3, \dots, a_n, \dots$ is defined by $a_1 = 1$ and $a_n = a_{n-1} + n$ for all integers $n \geq 2$. What is the value of a_{49} ?

$$a_{49} = \boxed{\quad}$$

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



In the figure above, what is the value of x ?

- 13
- 17
- 31
- 39
- 51

Select one answer choice.

Value	Frequency
1	20
2	18
3	14
4	13
5	12
6	10
7	9
8	8
Total	104

The frequency distribution for a data set is shown above. What is the median of the distribution?

- 3
- 3.5
- 4
- 4.5
- 5

Select one answer choice.



Which of the following is equivalent to $0 < x < 2$?

- $x = 1$
- $|x| < 1$
- $|x| < 2$
- $|x + 1| < 1$
- $|x - 1| < 1$

Select one answer choice.

A certain brand of dishwashing liquid was sold in two different bottle sizes. The small bottle was sold with $\frac{2}{5}$ as many ounces of liquid as the large bottle and was sold at a price that was $\frac{1}{2}$ the price of the large bottle.

Quantity A

The price per ounce of the liquid in the small bottle

Quantity B

The price per ounce of the liquid in the large bottle

- 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.

The random variable Y is normally distributed with a mean of 50.0 and a standard deviation of 5.4.

Quantity A

The probability that Y is between 44.6 and 48.2

Quantity B

The probability that Y is between 55.4 and 59.0

- 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.

Quantity A

$$\left(\frac{x+y}{2}\right) - \left(\frac{x-y}{2}\right)$$

Quantity B

$$y$$

- 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.

$$x > y > \sqrt{2}$$

Quantity A

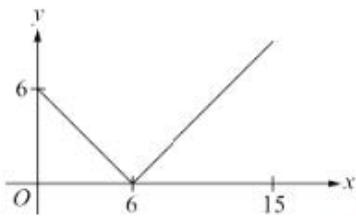
$$x + y$$

Quantity B

$$xy$$

- 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.



In the xy -plane, the graph of the function $y = f(x)$ for $0 \leq x \leq 15$ consists of two line segments intersecting at the point $(6, 0)$. The slopes of the two line segments are -1 and 1 .

Quantity A

$$f(3)$$

Quantity B

$$f(9)$$

- 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.

$$x \neq 0$$

y is a negative integer.

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.

When integer n is divided by 8, the remainder is 3. When integer n^2 is divided by 8, the remainder is R .

Quantity A

R

Quantity B

1

- 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.

One cup of a certain type of yogurt contains 9 grams of protein, which is equal to x percent of the recommended daily consumption of protein. How many grams is the recommended daily consumption of protein in terms of x ?

- $9x$ $\frac{x}{9}$ $\frac{100x}{9}$ $\frac{9}{100x}$ $\frac{900}{x}$

Select one answer choice.

A stone was dropped into a still pond and produced concentric circular ripples on the surface of the water. The radius of the outermost ripple increased at a constant rate of x feet per second. If the area of the circular region enclosed by the outermost ripple was 400π square feet 10 seconds after the stone hit the water, what is the value of x ?

- 2 4 20 $\sqrt{40}$ $\sqrt{200}$

Select one answer choice.

At a certain gasoline station last year, the price of gasoline on July 1 was 10 percent higher than it was on January 1, and the price of gasoline on December 31 was 30 percent higher than it was on January 1. Which of the following is closest to the percent increase in the price of gasoline at this station from July 1 to December 31 last year?

- 15% 18% 20% 22% 43%

Select one answer choice.

For all positive even integers n , $n\rfloor$ represents the product of all even integers from 2 to n , inclusive. For example, $12\rfloor = 12 \times 10 \times 8 \times 6 \times 4 \times 2$. What is the greatest prime factor of $20\rfloor + 22\rfloor$?

- 41
- 23
- 19
- 17
- 11

Select one answer choice.

List A: 1, 5, 9, 13, 4

List B: 1, 5, 9, 13, 9

List C: 1, 5, 9, 13, 7

List D: 1, 5, 9, 13, 6

The standard deviation of n numerical data $x_1, x_2, x_3, \dots, x_n$ with mean \bar{x} is equal to $\sqrt{\frac{S}{n}}$, where S is the sum of the squared differences $(x_i - \bar{x})^2$ for $1 \leq i \leq n$.

Which of the following shows lists A, B, C, and D in order from the list with the least standard deviation to the list with the greatest standard deviation?

- A, B, C, D
- A, D, B, C
- B, C, D, A
- C, B, D, A
- C, D, B, A

Select one answer choice.

The integer n is greater than 1, and $S = \{5 - n, 5 - n^2, 5 + n^2\}$. If the difference between the greatest number in S and the least number in S is 72, what is the value of n ?

$$n = \boxed{}$$

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

Questions 14 to 16 are based on the following data.

Theater Revenues for Seven Movies

Movie	Number of Weeks Movie Has Been Released	Total Revenue (in millions)	Number of Theaters (first week released)	Average* Revenue per Theater (first week released)
A	2	\$32.4	2,800	\$5,250
B	3	\$53.6	3,100	\$5,060
C	1	\$13.0	2,900	\$4,480
D	8	\$61.1	1,800	\$4,450
E	5	\$38.6	1,500	\$4,150
F	3	\$28.2	1,600	\$3,840
G	10	\$86.5	900	\$3,220

*arithmetic mean

When Movie C has been released for 10 weeks, its producers expect it to have a total revenue equal to the total revenue of Movie G for the 10 weeks of its release. To meet this expectation, approximately what must be the average (arithmetic mean) revenue per week of Movie C for the next 9 weeks of its release?

 \$7.35 million \$7.67 million \$8.17 million \$9.19 million \$9.61 million

Select one answer choice.

Questions 14 to 16 are based on the following data.

Theater Revenues for Seven Movies

Movie	Number of Weeks Movie Has Been Released	Total Revenue (in millions)	Number of Theaters (first week released)	Average* Revenue per Theater (first week released)
A	2	\$32.4	2,800	\$5,250
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D	8	\$61.1	1,800	\$4,450
E	5	\$38.6	1,500	\$4,150
F	3	\$28.2	1,600	\$3,840
G	10	\$86.5	900	\$3,220

*arithmetic mean

The total revenue for Movie F is approximately what percent less than the total revenue for Movie B?

- 25%
- 47%
- 53%
- 75%
- 90%

Select one answer choice.

Questions 14 to 16 are based on the following data.

Theater Revenues for Seven Movies

Movie	Number of Weeks Movie Has Been Released	Total Revenue (in millions)	Number of Theaters (first week released)	Average* Revenue per Theater (first week released)
A	2	\$32.4	2,800	\$5,250
B	3	\$53.6	3,100	\$5,060
C	1	\$13.0	2,900	\$4,480
D	8	\$61.1	1,800	\$4,450
E	5	\$38.6	1,500	\$4,150
F	3	\$28.2	1,600	\$3,840
G	10	\$86.5	900	\$3,220

*arithmetic mean

For the revenue of Movie *B* in the first week it was released and the revenue of Movie *E* in the first week it was released, approximately what was the average revenue per theater for the two movies combined?

 \$4,447 \$4,605 \$4,622 \$4,654 \$4,763

Select one answer choice.

	Department A	Department B	Department C
Number of employees	25	15	19
Average number of vacation days	12.8	10.4	x

For each of three departments of a certain business at the end of 2011, the table above shows the number of employees and the average (arithmetic mean) number of vacation days taken by the employees in 2011. The average number of vacation days taken by all of the employees in the three departments in 2011 was 10.0. If each employee worked in only one department, what is the value of x ?

$$x = \boxed{\quad}$$

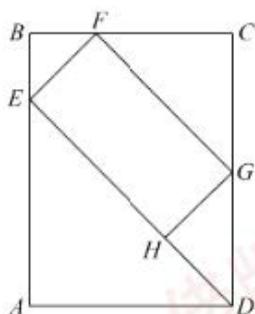
Enter your answer as an integer or a decimal in the answer box. Backspace to erase.

$$S = \{1, 3, 5, 7, \dots, 397, 399\}$$

Set S consists of the odd numbers from 1 to 399, inclusive. How many different ordered pairs (p, t) can be formed, where p and t are numbers in S and $p < t$? (Note: The sum of the integers from 1 to n , inclusive, is given by the formula $\frac{n(n+1)}{2}$ for all positive integers n .)

- 19,900
- 20,000
- 49,500
- 79,600
- 79,800

Select one answer choice.



In the figure, $ABCD$ and $EFGH$ are rectangular regions. The length of line segment BF is 4, and the measure of angle AED is 45 degrees. If G is the midpoint of side CD , what is the area of $EFGH$?

- $32\sqrt{2}$
- $32\sqrt{3}$
- $64\sqrt{2}$
- 32
- 64

Select one answer choice.

$$\left(\frac{100}{x} + \frac{100}{y} \right) T = 100$$

Which of the following statements individually provide(s) sufficient additional information to determine the value of T ?

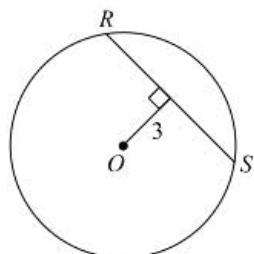
Indicate all such statements.

$x + y = 10$

$\frac{x}{y} = \frac{3}{2}$

$\frac{xy}{x+y} = \frac{12}{5}$

Select one or more answer choices.



The circle with center O has radius 5.

Quantity A

The length of chord RS

Quantity B

6

- 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.

a and b are integers.

$$\frac{a}{b} = -\frac{1}{3}$$

Quantity A

a

Quantity B

b

- 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.

C_1 and C_2 are two circles in the xy -plane.

The center of circle C_1 is inside circle C_2 .

Quantity A

The number of points at which C_1 and C_2 intersect

Quantity B

1

- 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.

$$\frac{\sqrt{y}}{4} = \frac{\sqrt{k}}{5}$$
$$yk \neq 0$$

Quantity A

$$\frac{y}{k}$$

Quantity B

$$\frac{25}{16}$$

- 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.

Quantity A

The number of tenths equal to 1.4

Quantity B

The number of hundredths equal to 1.3

- 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.

The average (arithmetic mean) price of 8 used books is \$1.55.

Quantity A

The total price of n of the 8 books ($n > 0$)

Quantity B

$(\$1.55)n$

- 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.

$$S = \{1, 2, 3\}$$
$$T = \{1, 2, 3, 4\}$$

Quantity A

The number of 4-digit positive integers that can be formed using only the digits in set S

Quantity B

The number of 3-digit positive integers that can be formed using only the digits in set T

- 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.

$x_1, x_2, x_3, \dots, x_j, \dots$

The sequence shown is defined by $x_1 = 2$ and $x_{j+1} = \frac{1}{2}x_j$ for each positive integer j .

Quantity A x_9 Quantity B $(2^{13})x_{22}$

- 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.

When the integer n is divided by 35, the remainder is 14. Which of the following must be a divisor of n ?

- 2
- 3
- 6
- 7
- 11

Select one answer choice.

On a trip, Marie drove the first half of the distance at an average speed of 30 miles per hour for a total of 13 hours of driving, and Juanita will drive the second half of the trip. They scheduled t hours driving for the entire distance. If they are to arrive exactly on schedule, at what average speed must Juanita drive the second half of the distance?

- $\frac{t - 13}{(30)(13)}$ $\frac{(t - 13)(13)}{30}$ $\frac{(t - 13)(30)}{13}$ $\frac{(30)(13)}{t - 13}$ $\frac{30}{(13)(t - 13)}$

Select one answer choice.

At a certain school, there are 46 students enrolled in biology, and 42 students enrolled in chemistry. If 20 students are enrolled in both biology and chemistry, how many students are enrolled in one of these courses, but not enrolled in the other?

- 48
- 54
- 64
- 68
- 78

Select one answer choice.

P is the set of all positive factors of 20, and Q is the set of all positive factors of 12. If a member of P will be chosen at random, what is the probability that the chosen member will also be a member of Q ?

- $\frac{1}{6}$
- $\frac{1}{4}$
- $\frac{1}{2}$
- $\frac{2}{3}$
- $\frac{5}{6}$

Select one answer choice.

Last year the value of one share of a certain stock increased by 10 percent from January to June, and the value of one share of the stock increased by 50 percent from January to December. What was the percent increase in the value of one share of the stock from June to December of last year?

Give your answer to the nearest whole percent.

 %

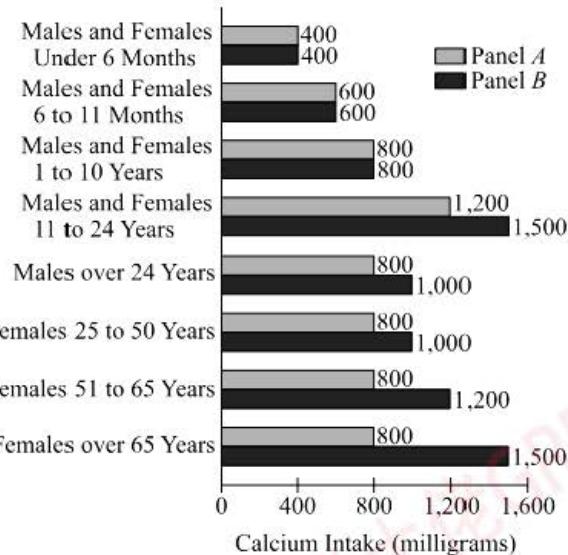
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Enter your answer as an integer or a decimal in the answer box. Backspace to erase.

Section 2 of 6 | Question 14 of 20

00:34:33 Hide Time

Questions 14 to 16 are based on the following data.

**Daily Calcium Intake, by Age and Gender,
Recommended by Two Expert Panels**

For how many of the eight groups shown is the daily calcium intake recommended by panel *B* at least 30 percent greater than that recommended by panel *A*?

- One
- Two
- Three
- Four
- Five

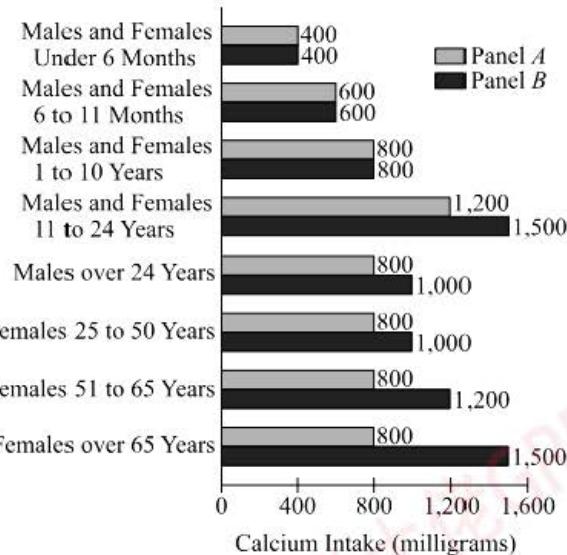
Select one answer choice.

Section 2 of 6 | Question 15 of 20

00:34:30 Hide Time

Questions 14 to 16 are based on the following data.

**Daily Calcium Intake, by Age and Gender,
Recommended by Two Expert Panels**

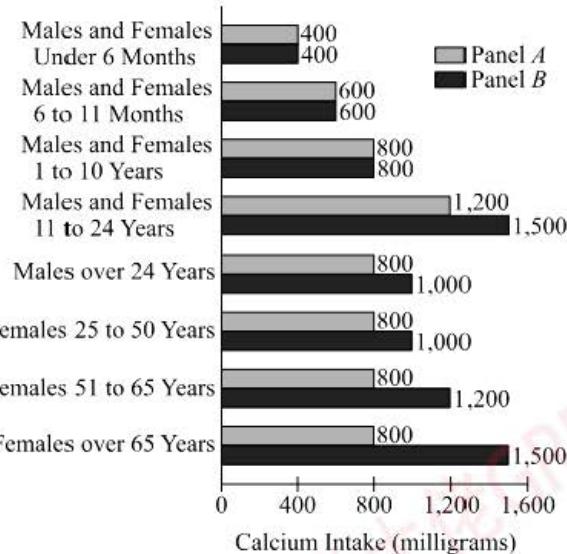


Panel B's recommended daily calcium intake for females 70 years old is what percent of that panel's recommended daily calcium intake for males 70 years old?

- 25%
- 50%
- 67%
- 100%
- 150%

Select one answer choice.

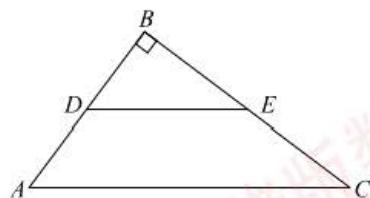
Questions 14 to 16 are based on the following data.

**Daily Calcium Intake, by Age and Gender,
Recommended by Two Expert Panels**

An 8-ounce serving of a certain type of yogurt contains 40 percent of the daily calcium intake recommended by panel *A* for males over 24 years. How many ounces of this yogurt contains 40 percent of the daily calcium intake recommended by panel *B* for females over 65 years?

- 15.0
- 16.0
- 17.5
- 25.0
- 37.5

Select one answer choice.



In the figure above, line segments AC and DE are parallel, $AC = 2(DE)$, $DE = 5$, and $AD = 3$. What is the area of triangle ABC ?

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

If $t = h^2 + 2$ and h is an integer from -5 to 2 , inclusive, then the greatest possible value of t is how much more than the least possible value of t ?

- 16
- 18
- 21
- 25
- 27

Select one answer choice.

The average (arithmetic mean) of the r integers in a certain list is 23, and the average of the k integers in another list is 20. If $r = 4k$, what is the average of the $r + k$ integers in the two lists?

- 22.1
- 22.4
- 22.7
- 23.0
- 23.3

Select one answer choice.

Vladimir invested \$10,000 for one year. He invested some of the amount at 4 percent simple annual interest and the rest of the amount at 6 percent simple annual interest.

If the total interest earned for the year was between \$450 and \$550, which of the following statements must be true?

Indicate all such statements.

- The amount invested at 6 percent simple annual interest was greater than \$2,000.
- The amount invested at 6 percent simple annual interest was less than \$8,000.
- The amount invested at 6 percent simple annual interest was more than 3 times the amount invested at 4 percent simple annual interest.

Select one or more answer choices.

The total number of people in a certain park is T , the number of people in the park who are under 20 years old is C , and the number of people who are hiking in the park is H .

Quantity A

$$T - C$$

Quantity B

$$H$$

- 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.

Quantity A

The greatest possible value of $\frac{5}{x-y}$, where
 $7 \leq x \leq 11$ and $-4 \leq y \leq 5$

Quantity B

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.

<u>Quantity A</u>	<u>Quantity B</u>
$(1.98)(81)(99)(1,249)$	25,000,000
<input type="radio"/> Quantity A is greater.	
<input type="radio"/> Quantity B is greater.	
<input type="radio"/> The two quantities are equal.	
<input type="radio"/> The relationship cannot be determined from the information given.	

Select one answer choice.

Pumps X and Y , each working alone at its own constant rate, would take 8 hours and 24 hours, respectively, to fill a swimming pool.

Quantity A

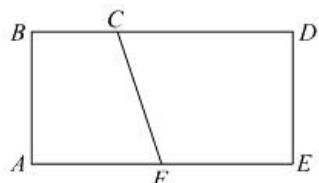
The number of hours that pumps X and Y , working together at their own constant rates, would take to fill the pool

Quantity B

8 hours

- 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.



In rectangle $ABDE$ shown, $AF = FE$ and $BC = \frac{1}{3}(BD)$.

Quantity A

The ratio of the area of trapezoid $ABCF$ to the area of trapezoid $FCDE$

Quantity B

$\frac{5}{7}$

- 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.

x and y are integers such that $x \geq 0$ and $y \geq 0$.

Quantity A

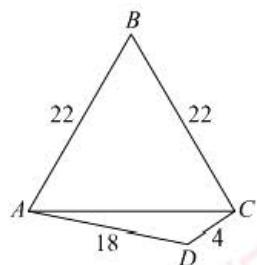
The total number of ordered pairs (x, y) that satisfy the inequality $2x + 3y < 5$

Quantity B

4

- 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.



Quantity A

The measure of angle ABC

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.

A store purchased a refrigerator at a wholesale price of \$800 and then listed the refrigerator at a retail price that was 60 percent greater than the wholesale price. During a sale, the store reduced the listed retail price of the refrigerator by 25 percent. A customer purchased the refrigerator at the reduced price and used a coupon to receive an additional 10 percent discount on the reduced price. If the sales tax charged by the store was 8.75 percent of the amount that the customer paid for the refrigerator, what was the amount of the sales tax?

- \$71.05
- \$72.80
- \$75.60
- \$84.00
- \$87.50

Select one answer choice.

Of the 250 students enrolled in a college economics course, 50 percent have never taken an economics course before. If 20 percent of the students in the class are sophomores and 80 percent of the sophomores in the class have never taken an economics course before, how many of the students in the class who have taken an economics course before are not sophomores?

- 85
- 90
- 100
- 105
- 115

Select one answer choice.

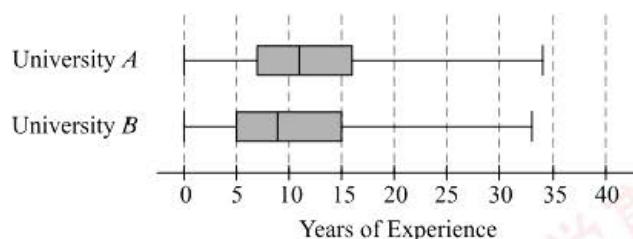
Rank	Win Percentage
Beginner	Less than 25%
Intermediate	25% to 40%
Expert	Greater than 40%

In a certain online game, players are assigned the ranks of Beginner, Intermediate, and Expert based on the win percentage, which is the number of games won by a player as a percent of the total number of games played by the player. For a player who played 50 or more games, the table shows the rank based on the win percentage. A certain player won 27 of the first 90 games played and was assigned the rank of Intermediate. The player won n of the next 90 games played and was again assigned the rank of Intermediate. Which of the following could be the value of n ?

Indicate all such values.

- 10 20 30 40 50 60 70 80

Select one or more answer choices.



For the professors at universities A and B , the number of years of experience for each professor was rounded to the nearest whole number and recorded, and the recorded numbers are summarized in the boxplots shown. If the first quartile of the recorded numbers of years of experience for the professors at A is p percent greater than that for B and if the third quartile of the recorded numbers of years of experience for the professors at A is r percent greater than that for B , approximately what is the value of $p + r$?

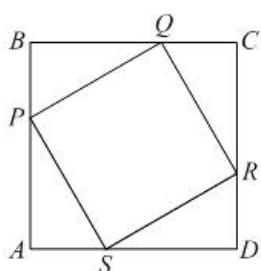
- 5
- 15
- 35
- 40
- 45

Select one answer choice.

In a certain 10-sided polygon, 9 interior angles are congruent and the measure of the remaining interior angle is 108 degrees. What is the measure of an exterior angle at the vertex of one of the congruent angles?
(Note: An exterior angle at a vertex of a polygon is the angle between one side of the polygon and a line extended from an adjacent side of the polygon.)

- 32
- 34
- 36
- 38
- 40

Select one answer choice.



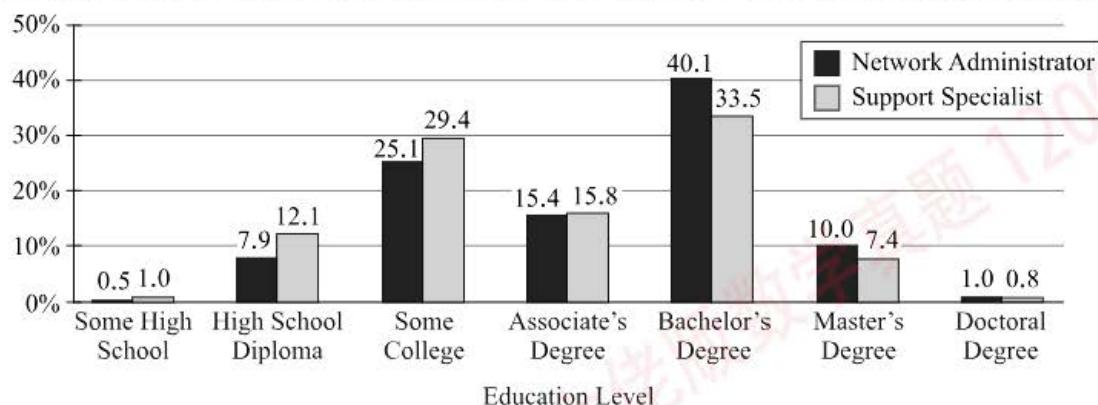
In the figure shown, square $PQRS$ is inscribed in square $ABCD$. If the perimeter of square $ABCD$ is 60 and the measure of angle RQC is 60 degrees, which of the following is closest to the perimeter of square $PQRS$?

- 42.5
- 43.9
- 45.2
- 47.0
- 47.4

Select one answer choice.

Questions 14 to 16 are based on the following data.

Percent of Network Administrators and Support Specialists at a Computer Company, by Highest Education Level Achieved



The number of network administrators with an education level of associate's, bachelor's, master's, or doctoral degree is closest to which of the following fractions of the total number of network administrators?

$\frac{5}{9}$

$\frac{29}{50}$

$\frac{3}{5}$

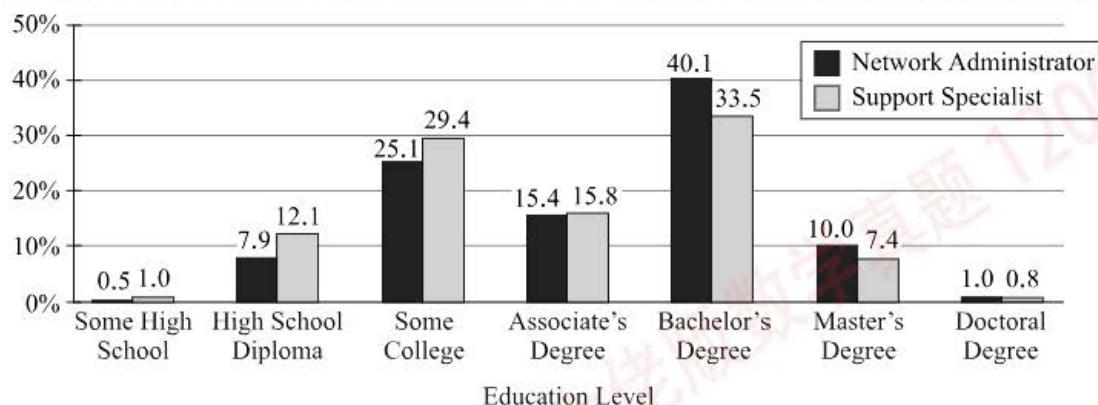
$\frac{5}{8}$

$\frac{2}{3}$

Select one answer choice.

Questions 14 to 16 are based on the following data.

Percent of Network Administrators and Support Specialists at a Computer Company, by Highest Education Level Achieved



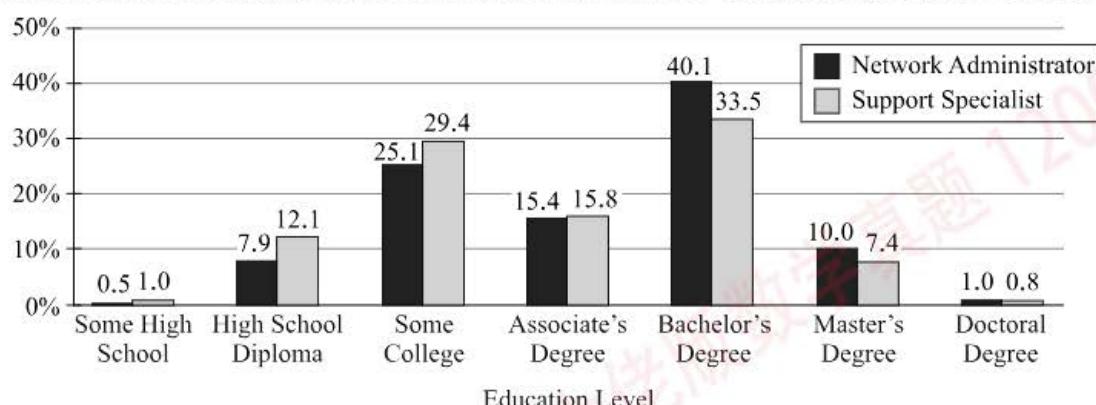
One support specialist will be selected at random from the support specialists with an education level of associate's, bachelor's, master's, or doctoral degree. Which of the following is closest to the probability that the selected support specialist will be one who has an education level of associate's degree?

- 0.16 0.23 0.27 0.30 0.38

Select one answer choice.

Questions 14 to 16 are based on the following data.

Percent of Network Administrators and Support Specialists at a Computer Company, by Highest Education Level Achieved



Based on the information given, which of the following statements must be true?

Indicate all such statements.

- The number of network administrators with an education level of some college is greater than 75 percent of the number of support specialists with an education level of some college.
- The number of network administrators with an education level of bachelor's degree is greater than the number of support specialists with an education level of bachelor's degree.
- The number of network administrators with an education level of bachelor's degree exceeds the number of network administrators with an education level of master's degree by more than 275 percent.

Select one or more answer choices.

What is the value of $\left(\frac{(2^{-2})(3^2)}{(3^{-2})(2^2)} \right)^{-1}$?

Give your answer as a fraction.

<input type="text"/>
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Enter your answer as a fraction, with the numerator and denominator in their respective answer boxes. Backspace to erase.

$$n = 13! + 15!$$

What is the number of distinct prime factors of n ?

- 5
- 6
- 7
- 10
- 12

Select one answer choice.

If $nk > 10^4$, then the value of $\frac{n + \frac{1}{k}}{2n}$ is closest to which of the following?

- 0.1
- 0.2
- 0.3
- 0.4
- 0.5

Select one answer choice.

If $4x - 5 < 10$ and $5 - 3x \leq 17$, which of the following could be the value of x ?

Indicate all such values.

- 5
- 4
- 3
- 2
- 2
- 3
- 4
- 5

Select one or more answer choices.

Country R 's population in 1975 was 90 percent of its population in 1990.

Quantity A

The population of Country R in 1990

Quantity B

1.1 times the population of Country R in
1975

- 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.

n is an integer greater than or equal to 5.

Quantity A

The number of positive factors of n

Quantity B

The number of positive factors of $n + 2$

- 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.

$\frac{k}{a} = p + 1$ and $\frac{b}{k} = \frac{1}{p}$, where a , b , k , and p are positive.

Quantity A

a

Quantity B

b

- 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.

The area of a circular region is 5π .

Quantity A

The diameter of the circular region

Quantity B

$\sqrt{20}$

- 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.

x and y are two consecutive positive odd integers.

Quantity A

The remainder when $x^2 + y^2$ is divided by 4

Quantity B

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.

The reciprocal of n equals 8 times the square of n .

Quantity A

$$\frac{1}{n}$$

Quantity B

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.

The probabilities that independent events A and B will occur tomorrow are 0.60 and 0.80, respectively.

Quantity A

The probability that A or B or both will occur tomorrow

Quantity B

0.92

- 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.

An appliance dealer purchased refrigerators of a certain model for \$850 each. The dealer sold each refrigerator at a 25 percent discount off a regular price of p dollars. If the dealer's profit on each refrigerator was 20 percent of the amount for which the dealer purchased each refrigerator, what is the value of p ? (Note: Profit equals revenue minus cost.)

- 1,063
- 1,150
- 1,233
- 1,328
- 1,360

Select one answer choice.

The weights of 80,000 fish are approximately normally distributed with a mean of 12.5 ounces and a standard deviation of 4.2 ounces. Approximately what percent of the 80,000 fish have weights between 16.7 and 20.9 ounces?

- 14%
- 20%
- 27%
- 34%
- 48%

Select one answer choice.

Jamie claimed that if n is a positive integer, then $4n^2 - 3$ must be a prime number. Which of the following values of n could be used as a counterexample to show that Jamie's claim is not true?

Indicate all such values.

- 3
- 4
- 6

Select one or more answer choices.

$$S = \{1, 2, 3, 4, 6\}$$

$$T = \{1, 2, 3, 6, 8\}$$

From set S , an integer is chosen and called s , and from set T an integer is chosen and called t . The product of the two integers s and t is called p . What is the total number of different values of p that can be determined in this way?

- 5
- 9
- 14
- 18
- 25

Select one answer choice.

$$n = 1234567891011\dots499500$$

The digits of the integer n above are the digits of the integers from 1 to 500 written in consecutive order.
How many digits does n have?

- 1,389
- 1,392
- 1,393
- 1,409
- 1,410

Select one answer choice.

$$1 + 2 + 3 + \dots + n = \frac{n(n+1)}{2}$$

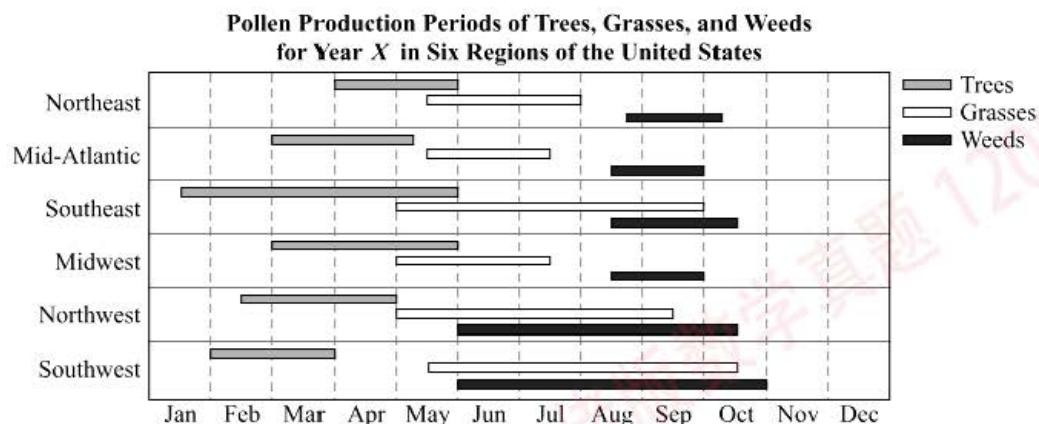
For each integer n greater than 1, the sum of the first n positive integers is given by the formula shown.

If the average (arithmetic mean) of the first n positive integers is k , what is the sum of the first n positive integers in terms of k ?

- $k^2 - k$
- $\frac{k^2 - k}{2}$
- $\frac{k^2 + k}{2}$
- $2k^2 - k$
- $4k^2 + 2k$

Select one answer choice.

Questions 14–16 are based on the following data.

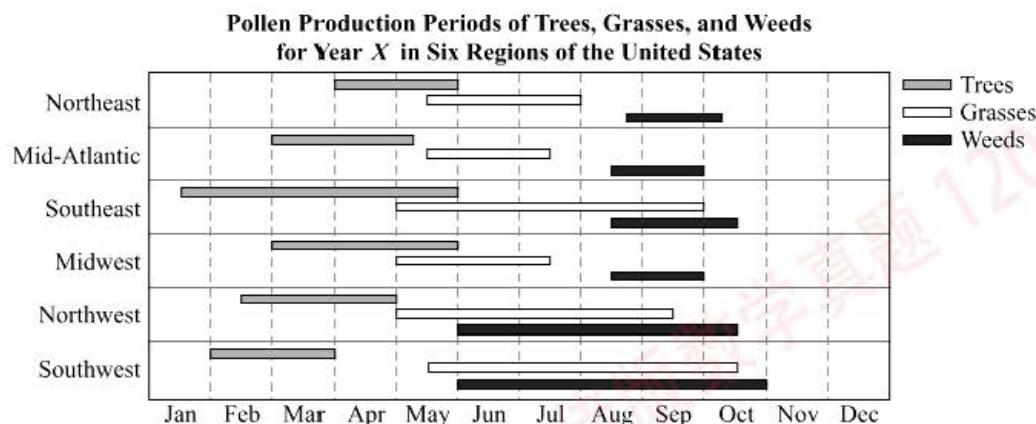


For Year X, in how many of the six regions did grasses produce pollen for a period of less than three months?

- None Two Three Four Five

Select one answer choice.

Questions 14–16 are based on the following data.



For approximately what fraction of Year X was pollen produced by both grasses and weeds in the Southwest?

$\frac{9}{24}$

$\frac{11}{24}$

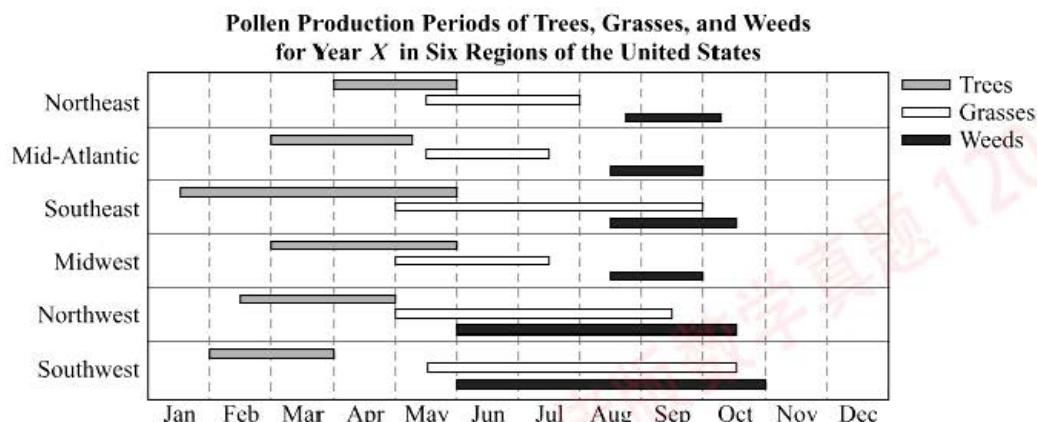
$\frac{12}{24}$

$\frac{14}{24}$

$\frac{20}{24}$

Select one answer choice.

Questions 14–16 are based on the following data.



For year X , which of the following is closest to the total length, in months, of the time period during which no pollen was produced by trees or grasses in any of the six regions?

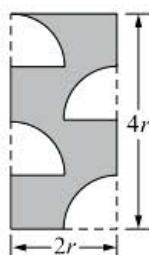
 0.5 1.0 2.0 2.5 3.0

Select one answer choice.

List $K : 70, 75, 80, -10x, x^2$

The average (arithmetic mean) of the numbers in list K is 40. What is the range of the numbers in K ?

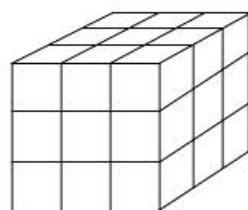
Enter your answer as an integer or a decimal in the answer box. Backspace to erase.



What is the perimeter of the shaded region of the rectangle shown above if each of the unshaded regions is a 90-degree sector of a circle with radius r ?

- $(12 + 2\pi)r$
- $(11 + 2\pi)r$
- $(10 + 2\pi)r$
- $(8 + 2\pi)r$
- $(4 + 2\pi)r$

Select one answer choice.



If 20 red cubes and 7 white cubes, all of equal size, are fitted together to form one large cube, as shown above, what is the greatest fraction of the surface area of the large cube that could be red?

- $\frac{10}{27}$
- $\frac{20}{27}$
- $\frac{47}{54}$
- $\frac{8}{9}$
- $\frac{49}{54}$

Select one answer choice.

List S : 1, 2, 3, k , $2k$

If $k < 2$, which of the following numbers could be the median of the five numbers in list S ?

Indicate all such numbers.

- 1
- 2
- 3
- k
- $2k$

Select one or more answer choices.