Section 1

1.

In a fruit basket containing apples, pears, and oranges, the ratio of the number of apples to the number of pears is 3 to 4, and the ratio of the number of pears to the number of oranges is 5 to 3.

Quantity A	Quantity B
The number of apples in the fruit basket	The number of oranges in the fruit basket

○ Quantity A is greater.

○ Quantity B is greater.

○ The two quantities are equal.

○ The relationship cannot be determined
  from the information given.

2.

$$0 < x < y$$

Quantity A	Quantity B
x percent of y	y percent of x

3.

The average (arithmetic mean) of x and z is greater than y, and $x < y < z$.

Quantity A	Quantity B
The average of x, y, and z	The median of x, y, and z

4.

$$\frac{a^2}{b^2} = \frac{a}{b}$$

$$ab \neq 0$$

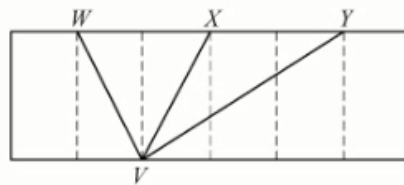| Quantity A	Quantity B
a	b

5.

Quantity A	Quantity B
The least integer x that satisfies the inequality $x^3 > -30$	-3

6.

The dotted line segments separate the rectangular region into six identical smaller rectangular regions.

Quantity A	Quantity B
The area of triangular region WXV	The area of triangular region XYV

7.

$$a \neq 0$$

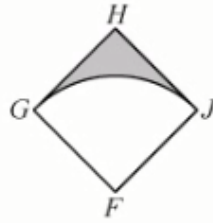| Quantity A	Quantity B
$a + 1$	$\frac{1}{a} - 1$

8.

Square $FGHJ$ has sides of length x. Region FGJ is a sector of the circle with center F.

Quantity A	Quantity B
The area of the shaded region	$\dfrac{x^2}{4}$

9.

SOURCES OF FINANCIAL SUPPORT FOR A NONPROFIT ORGANIZATION

Source	Percent of Financial Support
Corporations	37%
Federal/state governments	33%
Individuals	22%
Others	8%

The table shows the percent distribution of financial support for a nonprofit organization, by source. The amount of financial support from individuals is approximately what percent less than the amount from corporations?

○ 24%   ○ 35%   ○ 41%   ○ 69%   ○ 88%

10.

Data Set X	Data Set Y
x_1	$5x_1 + 16$
x_2	$5x_2 + 16$
x_3	$5x_3 + 16$
x_4	$5x_4 + 16$

Data sets X and Y each consist of 4 values, as shown in the table. If the range of data set X is 21, what is the range of data set Y?

- ○ 0
- ○ 37
- ○ 84
- ○ 100
- ○ 105

11.

Three different committees consist of 8, 10, and 13 people, respectively. If N is the total number of different people in the 3 committees combined, what is the least possible value of N ?

- ○ 13
- ○ 15
- ○ 21
- ○ 24
- ○ 31

12.

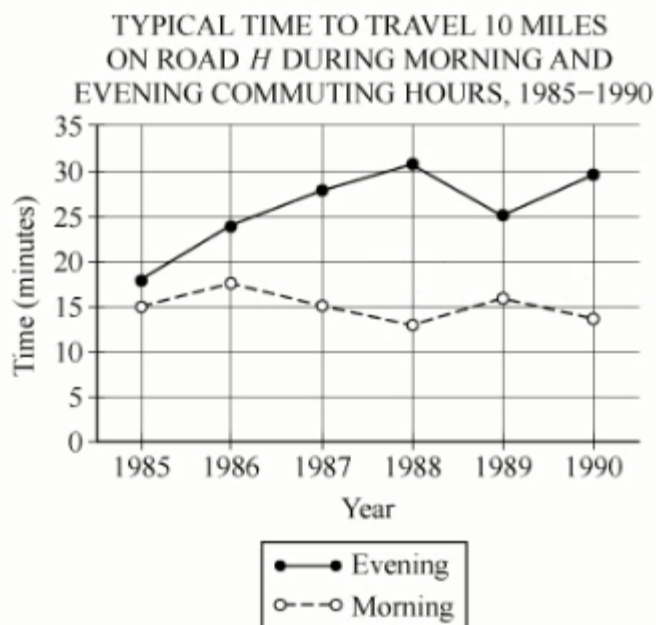If $\dfrac{17 + m}{43 + m} = \dfrac{2}{3}$, what is the value of m ?

13.

If n is a positive odd integer and $k = n^3 + 2n$, what is the value of $(-1)^k - (-1)^{k+1}$?

- ○ -2
- ○ -1
- ○ 0
- ○ 1
- ○ 2

14.

Questions 14 − 16 are based on the following data.

TYPICAL TIME TO TRAVEL 10 MILES
ON ROAD H DURING MORNING AND
EVENING COMMUTING HOURS, 1985−1990

For 1988, the typical travel time during the morning commuting hours was approximately what fraction of the typical travel time during the evening commuting hours?

- ○ $\frac{1}{3}$
- ○ $\frac{2}{5}$
- ○ $\frac{5}{9}$
- ○ $\frac{8}{13}$
- ○ $\frac{2}{3}$

15.

The typical travel time during the morning commuting hours
decreased by approximately what percent from 1986 to 1988?

- ○ 5%
- ○ 10%
- ○ 25%
- ○ 40%
- ○ 45%

16.

During the morning commuting hours in 1987, what was the
average speed, in miles per hour, of a car that traveled the 10 miles
on Road H if the car took the typical amount of time to travel the
10 miles?

- ○ 15
- ○ 20
- ○ 25
- ○ 33
- ○ 40

17.

A certain box contains 4 red blocks, 5 blue blocks, and 3 yellow blocks. Judy will
select one of these blocks at random from the box, put it back in the box, and then again
select a block at random from the box. What is the probability that both of the blocks
selected will be yellow?

Give your answer as a fraction.

$$\frac{\boxed{}}{\boxed{}}$$

18.

Mike, Scott, Jim, Kate, and Pete each have a different number of assignments this month. Pete has fewer assignments than Kate, Kate has more assignments than Mike, Mike has more assignments than Jim, and Jim has more assignments than Scott. Which of the following could be the person who has the median number of assignments this month for the five people listed?

Indicate all such people.

☐ Mike

☐ Scott

☐ Jim

☐ Kate

☐ Pete

19.

The legs of a right triangle are in the ratio of 3 to 1. If the length of the hypotenuse of the triangle is $\sqrt{40}$, then the perimeter of the triangle is between

○ 14 and 15

○ 13 and 14

○ 12 and 13

○ 11 and 12

○ 10 and 11

20.

If n and m are positive integers and m is a factor of 2^6, what is the greatest possible number of integers that can be equal to both $3n$ and $\frac{2^6}{m}$?

○ Zero

○ One

○ Three

○ Four

○ Six

Section 2

1.

A total of 1,500 boxes are stored in four warehouses. The number of boxes stored in the individual warehouses are x, y, z, and w, respectively, where $w = 2x$ and $z = 2y$.
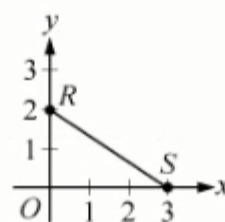
Quantity A	Quantity B
$x + y$	500

2.

In the xy-plane, line segment RS is one of the sides of square $RSTU$ (not shown).

Quantity A	Quantity B
The area of square $RSTU$	13

3.

$$T = \{2, 3, 5, 6, 7, 8, 9\}$$

Quantity A	Quantity B
The total number of positive 4-digit integers that can be formed where each digit is in set T and the 4 digits in each 4-digit integer are different from each other	$(7)(6)(5)(4)$

4.

n is a positive integer.

Quantity A	Quantity B
The remainder when 3^{4n} is divided by 10	1

5.

In the xy-plane, a line with equation $y = mx + b$, where m and b are constants and $mb \neq 0$, has a y-intercept that is twice the x-intercept.

Quantity A	Quantity B
m	-2

6.

n is a positive integer.

Quantity A	Quantity B
$\dfrac{1}{3^n}$	$3\left(\dfrac{1}{4^n}\right)$

7.
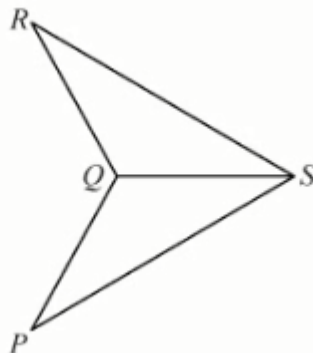
$PQ = QR = QS$

Quantity A	Quantity B
PS	RS

8.

A certain class of 90 students took a typing proficiency test. The average (arithmetic mean) score of the students who passed the test was 84, and the average score of the students who failed the test was 60. If the average score of all students was 80, how many students passed the test?

○ 15

○ 20

○ 42

○ 70

○ 75

9.

Which of the following equals $(8)(72)^{-5}$?

○ 8^{-4}

○ 8^{-5}

○ $\dfrac{(72)^{-4}}{9}$

○ $\dfrac{(72)^{-5}}{8}$

○ $\dfrac{(72)^{-6}}{9}$

10.

In the xy-plane, line ℓ is parallel to the line $y = 3x + 2$. If line ℓ passes through the point $(1, -1)$, then line ℓ passes through which of the following points?
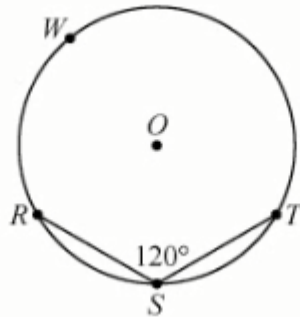
Indicate all such points.

☐ (2, 2)

☐ (0, −2)

☐ (−2, −10)

11.

If 2, 4, 6, and 9 are the digits of two 2-digit integers, what is the least possible positive difference between the integers?

○ 28

○ 27

○ 17

○ 13

○ 9

12.

The center of the circle is O, and $RS = ST = 4$. What is the length of arc RWT?

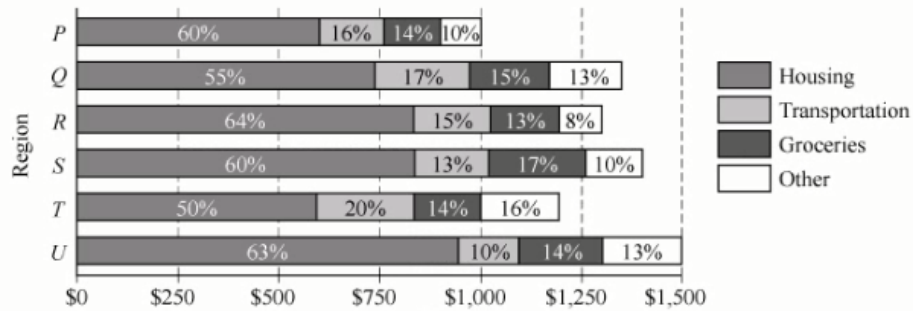○ $\dfrac{4\pi}{3}$ ○ $\dfrac{8\pi}{3}$ ○ $\dfrac{16\pi}{3}$ ○ 4π ○ 8π

13.

How many values of x are there such that x is an integer and $|3x - 2| < 8$?

○ One

○ Two

○ Three

○ Four

○ Five

14.

LIVING EXPENSES FOR A TYPICAL HOUSEHOLD IN SELECTED REGIONS
APRIL 2004

Note: The percents are based on total household living expenses.

In April 2004 the dollar amount of the Housing expense in region Q was less than the dollar amount of the Housing expense in which of the other regions?

Indicate all such regions.

☐ P ☐ R ☐ S ☐ T ☐ U

15.

In region P, the expense in the category Other was what fraction of the total of the expenses in the three nonhousing categories?
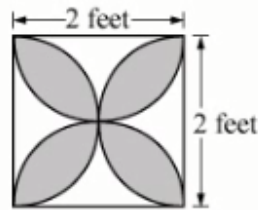
○ $\frac{1}{10}$ ○ $\frac{1}{6}$ ○ $\frac{1}{5}$ ○ $\frac{1}{4}$ ○ $\frac{1}{3}$

16.

For the region in which the range of the dollar amounts of the four expense categories was least, what percent of total living expenses was the Transportation expense in that region?

○ 10%   ○ 15%   ○ 16%   ○ 17%   ○ 20%

17.

The figure shows the design of a mosaic tile in which the four sides of the square are the diameters of four intersecting semicircles. Small blue stones are to be placed in the shaded regions and will cover 95 percent of the area of these regions. If each side of the square has length 2 feet, approximately how many square feet of the tile will be covered by the blue stones?

○ 0.9
○ 1.5
○ 2.2
○ 2.9
○ 3.2

18.

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

19.

Amy and Jed are among the 35 people, who are standing in a line, one behind the other, waiting to buy movie tickets. The number of people in front of Amy plus the number of people behind Jed is 24. If there are 15 people behind Amy, including Jed, how many people are in front of Jed?

○ 23

○ 25

○ 27

○ 29

○ 31

20.

The functions f and g are defined by $f(x) = |2x + 1|$ and $g(x) = 3$ for all numbers x. What is the least value of c for which $f(c) = g(c)$?

$$c = \boxed{}$$