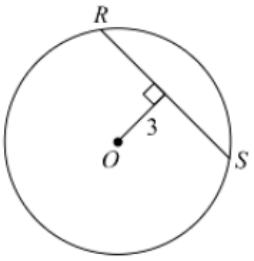
Section 13

1.



The circle with center O has radius 5.

Quantity A	Quantity B
The length of chord RS	6

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

2. a and b are integers.

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

Quantity A	Quantity B
a	b

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

3. 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	Quantity B
The number of points at which C_1 and C_2 intersect	1

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

4.

$$\frac{\sqrt{y}}{4}=\frac{\sqrt{k}}{5}$$

$yk \neq 0$

Quantity A	Quantity B
$\frac{y}{k}$	$\frac{25}{16}$

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

5.

Quantity A	Quantity B
The number of tenths equal to 1.4	The number of hundredths equal to 1.3

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

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

Quantity A	Quantity B
The total price of n of the 8 books (n>0)	($1.55)n

A. Quantity A is greater.
B. Quantity B is greater.
C. The two quantities are equal.

D. The relationship cannot be determined from the information given.

7.

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

Quantity A	Quantity B
The number of 4-digit positive integers that can be formed using only the digits in set S	The number of 3-digit positive integers that can be formed using only the digits in set T

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

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

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

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

A. 2
B. 3
C. 6
D. 7
E. 11

10. 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?

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

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

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

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

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

11. 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?

A. 48
B. 54
C. 64
D. 68
E. 78

12. 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?

A. $\frac{1}{6}$

B. $\frac{1}{4}$

C. $\frac{1}{2}$

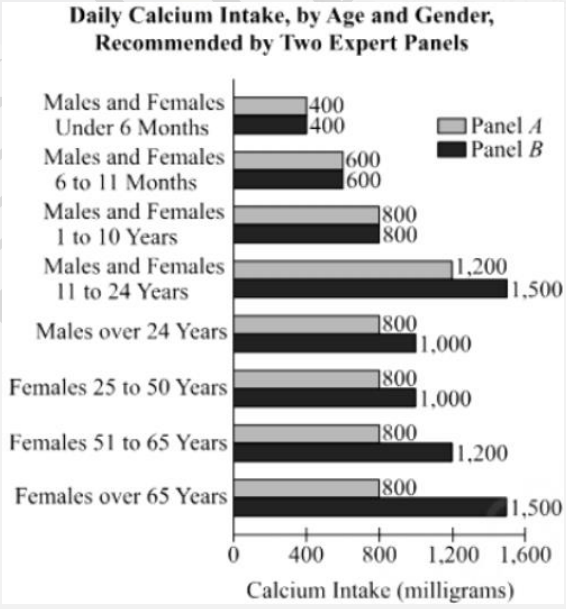
D. $\frac{2}{3}$

E. $\frac{5}{6}$

13. 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

_____%

Questions 14 and 16 are based on the following data



14. 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?

A. One

B. Two
C. Three
D. Four
E. Five

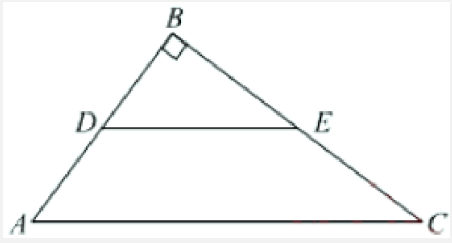
15. Panel B's recommended daily calcium intake for females 70 years old is what percent of that panel's recommended daily calcium intake for males 70 years old?

A. 25%
B. 50%
C. 67%
D. 100%
E. 150%

16. 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?

A. 15.0
B. 16.0
C. 17.5
D. 25.0
E. 37.5

17.



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 ?

18. 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?

A. 16
B. 18
C. 21
D. 25
E. 27

19. 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?

A. 22.1
B. 22.4
C. 22.7
D. 23.0
E. 23.3

20. 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.

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

Section 14

1. 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	Quantity B
T-C	H

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

2.

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

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

3.

Quantity A	Quantity B
(1.98)(81)(99)(1,249)	25,000,000

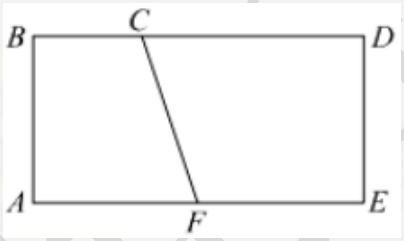
A. Quantity A is greater.
B. Quantity B is greater.
C. The two quantities are equal.
D. The relationship cannot be determined from the information given.

4. 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	Quantity B
The number of hours that pumps X and Y working together at their own constant rates, would take to fill the pool	8 hours

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

5.



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

Quantity A	Quantity B
The ratio of the area of trapezoid ABCF to the area of trapezoid FCDE	$\frac{5}{7}$

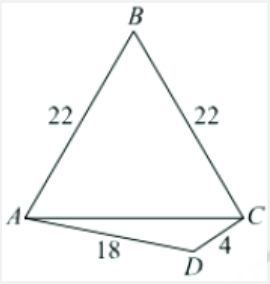
A. Quantity A is greater.
B. Quantity B is greater.
C. The two quantities are equal.
D. The relationship cannot be determined from the information given.

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

Quantity A	Quantity B
The total number of ordered pairs (x, y) that satisfy the inequality $2x+3y<5$	4

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

7.



Quantity A	Quantity B
The measure of angle ABC	60°

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

8. 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. It 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?

A. $71.05
B. $72.80
C. $75.60
D. $84.00
E. $87.50

9. 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?

A. 85
B. 90
C. 100
D. 105
E. 115

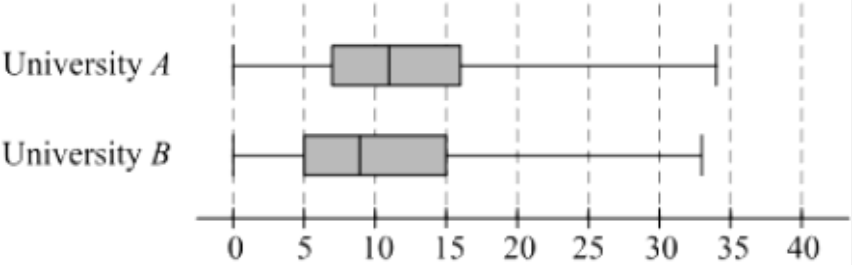
10.

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.

A. 10
B. 20
C. 30
D. 40
E. 50
F. 60
G. 70
H. 80

11.



Years of Experience

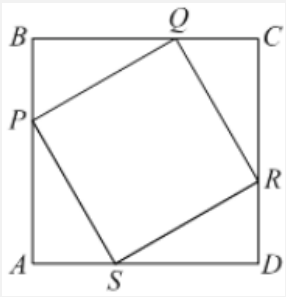
For the professors at universities A and B, the number of years of experience for each professor was rounded to the nearest whole number and recorded, and the recorded numbers are summarized in the boxplots shown. If the first quartile of the recorded numbers of years of experience for the professors 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?

A. 5
B. 15
C. 35
D. 40
E. 45

12. 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.)

A. 32
B. 34
C. 36
D. 38
E. 40

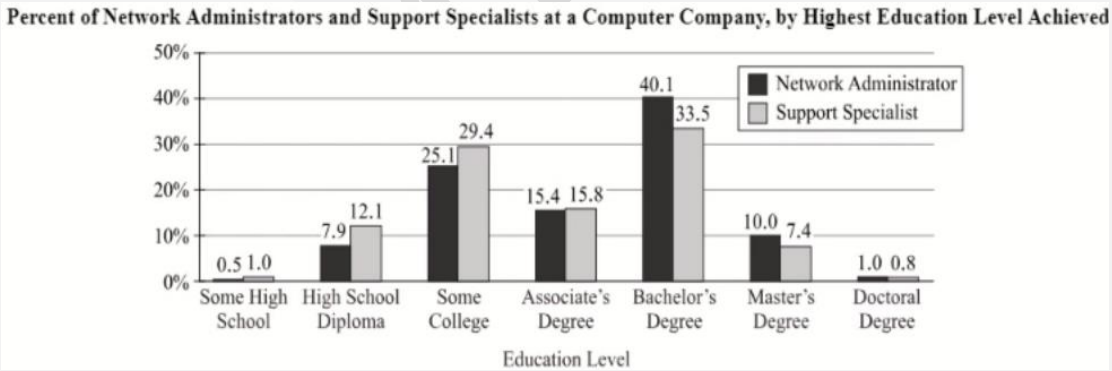
13.



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?

A. 42.5
B. 43.9
C. 45.2
D. 47.0
E. 47.4

Questions 14 and 16 are based on the following data



14. 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?

A. $\frac{5}{9}$

B. $\frac{29}{50}$

C. $\frac{3}{5}$

D. $\frac{5}{8}$

E. $\frac{2}{3}$

15. 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?

A. 0.16
B. 0.23
C. 0.27
D. 0.30
E. 0.38

16. Based on the information given, which of the following statements must be true? Indicate **all** such statements.

A. 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.
B. 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.
C. 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.

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

Give your answer as a fraction.

$\frac{\square}{\square}$

18.

$n=13!+15!$

What is the number of distinct prime factors of n?

A. 5
B. 6
C. 7
D. 10
E. 12

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

A. 0.1
B. 0.2
C. 0.3
D. 0.4
E. 0.5

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

Indicate **all** such values.

A. -5
B. -4
C. -3
D. -2
E. 2

F. 3
G. 4
H. 5

Section 16

1. From 1980 to 1990, the number of residents of Town X decreased by $\frac{1}{7}$ of its 1980 value, and the number of residents under the age of twenty decreased by 686 residents.

Quantity A	Quantity B
The number of residents in Town X under the age of twenty in 1990	4,116

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

2.

$x > 0$
$y < 0$

Quantity A	Quantity B
$(x-y)^2$	x^2+y^2

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

3.

k and n are consecutive positive odd integers.

Quantity A	Quantity B
The least common multiple of k and n	kn

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

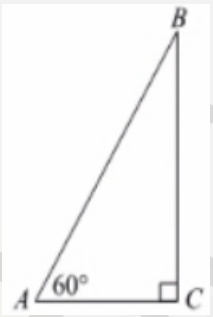
4.

$x^{10}=y^{10}$

Quantity A	Quantity B
x	y

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

5.



In right triangle ABC, the length of side AB is 100.

Quantity A	Quantity B
The length of side BC	75

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

6.

$2m-4p=x$

$\frac{1}{2}m-p=y$

$y\neq 0$

Quantity A	Quantity B
$\frac{x}{y}$	1

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

7. Events A and B are independent. The probability that event A will occur is 0.75, and the probability that event B will occur is p, where 0<p<1.

Quantity A	Quantity B
The probability that events A and B will both occur	1-0.25p

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

8. Triangle A is isosceles with two sides of length 8.
Triangle B is isosceles with two sides of length 10.

Quantity A	Quantity B
The area of triangle A	The area of triangle B

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

9. A certain town with a population of 50,000 uses an average of 5,000,000 gallons of water per day. If the average number of gallons of water used per person per day remained the same and the population of the town increased to 65,000, by how many gallons would the average amount of water used by the town per day increase?

A. 150,000
B. 650,000
C. 1,500,000
D. 3,500,000
E. 6,500,000

10.

A group of n people is categorized as follows:

9 people are taller than 6 feet.

14 people are shorter than $5\frac{1}{2}$ feet

12 people are under 21 years old.

If each person in the group is in at least one of the three categories, then n can be any integer between

A. 9 and 14, inclusive
B. 12 and 21, inclusive
C. 14 and 23, inclusive
D. 21 and 26, inclusive
E. 23 and 35, inclusive

11. If a, b, e, and fare positive integers and $\frac{a}{b}<\frac{e}{f}$, which of the following inequalities must be true?

A. a>f
B. b>e
C. $\frac{b}{a}>\frac{e}{f}$
D. $\frac{b}{a}>\frac{f}{e}$
E. $\frac{a}{b}>\frac{f}{e}$

12.

X={1, 3, 5, 8}
Y={2, 4, 6, 7}

Set T consists of all integers n such that $n=x^2+y$, where x is an integer from set X and Y is an integer from set Y. How many integers in T are even?

A. None
B. Two
C. Three
D. Six
E. Eight

13. Irina solved 30 easy crossword puzzles and 20 hard crossword puzzles. She spent an average (arithmetic mean) of 12.1 minutes per puzzle solving the easy puzzles and 30.1 minutes per puzzle solving the hard puzzles. What was the average number of minutes she spent per puzzle to solve the 50 puzzles?

_____minutes

Questions 14 and 16 are based on the following data

Selected Data for Men and Women over Age 65
Living in the United States, 1995

Category	Men	Women
Marital Status:		
Single (never married)	4.2%	4.2%
Married	77.1%	42.5%
Widowed	13.5%	47.3%
Divorced	5.2%	6.0%
Household Status:		
Living alone	17.3%	41.8%
Living with family members	74.6%	40.6%
Living with nonfamily members	8.1%	17.6%
Below poverty level	7.2%	14.9%
In the labor force	16.8%	8.8%

Note: *In 1995 there were 13.0 million men and 18.3 million women over age 65 in the United States.*

14. How many of the four marital-status categories contained between 1.3 million and 6.5 million men over age 65?

A. None
B. One
C. Two
D. Three
E. Four

15. Based on the information given, which of the following statements are true? Indicate **all** such statements.

A. There were more single women over age 65 than single men over age 65.
B. The fraction of the number of men over age 65 who were living with family members was less than $\frac{3}{4}$.
C. The number of women over age 65 living alone exceeded the number of men over age 65 living alone by more than 2 million.

16. If 3.5 percent of the women over age 65 in the labor force were unemployed, which of the following is closest to the percent of all women over age 65 who were employed?

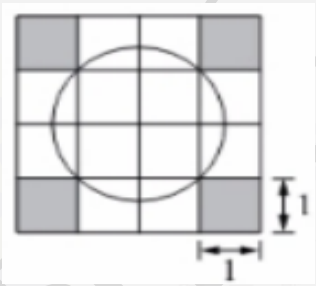
A.5.3%
B.6.5%
C.7.8%
D.8.2%
E.8.5%

17. In a list of consecutive integers, the least integer is -15 and the greatest is 87. How many integers are in the list?

18. A clothing manufacturer produces rectangular pieces of cloth that vary from 4 meters to 6 meters in length and from 2 meters to 2.5 meters in width. Which of the following values could be the area in square meters, of a piece of cloth produced? Indicate **all** such values.

A.8
B.10
C.12
D.14
E.16

19.



What is the area, in square units, of the circular region shown above?

A. π
B. 2π
C. 3π
D. 4π
E. 8π

20. In the xy-plane, the equation of line k is $y=\frac{2}{3}x-2$. Which of the following is a point on the line that is perpendicular to line k and has a y-intercept of 2?

A. (-3, 1)
B. (-2, 5)
C. (1, -1)
D. (3, 3)

E. (6, 2)