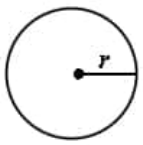
FRANKLIN LEARNING CENTER

616 N 15th St
Philadelphia, PA 19130

SUMMER WORK PACKAGE

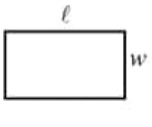
Multiple-choice questions
designed for Pre-Calculus graduates.

REFERENC

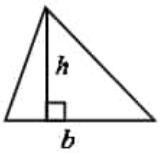


$A = \pi r^2$

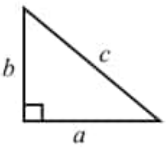
$C = 2\pi r$



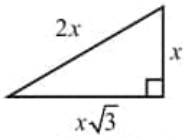
$A = \ell w$

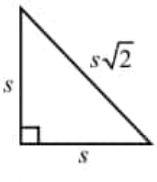


$A = \frac{1}{2}bh$

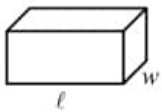


$c^2 = a^2 + b^2$

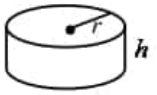




Special Right Triangles



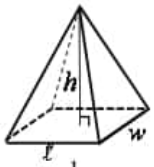
$V = \ell wh$



$V = \pi r^2 h$

$V = \frac{4}{3}\pi r^3$

$V = \frac{1}{3}\pi r^2 h$



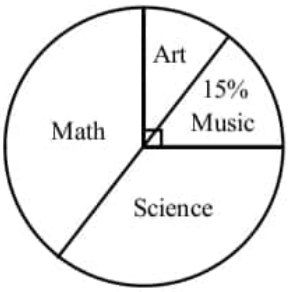
$V = \frac{1}{3}\ell wh$

The number of degrees of arc in a circle is 360.

The number of radians of arc in a circle is 2π.

The number of the measures in degrees of the angles of a triangle is 180.

1



A total of 40 students in Mr. Lee's class voted for their favorite subject. The results are shown in the pie chart above. How many students voted for math?

A) 12

B) 14

C) 16

D) 18

2

If $3r + 5 = 10$, what is the value of $6r + 5$?

A) 10

B) 15

C) 20

D) 21

3

If $a^{-2} = \frac{1}{5}$, what is the value of $5a^2$?

A) 1

B) 5

C) 10

D) 25

4

When a certain number p is divided by 10, the quotient is k and the remainder is r. Which of the following expressions represents r?

A) $r = p - 10k$

B) $r = 10p - k$

C) $r = 10(k - p)$

D) $r = 10k - p$

5

If $\frac{5}{12}=\frac{1}{a}+\frac{1}{b}$ and $ab=24$, what is the value of $a+b$?

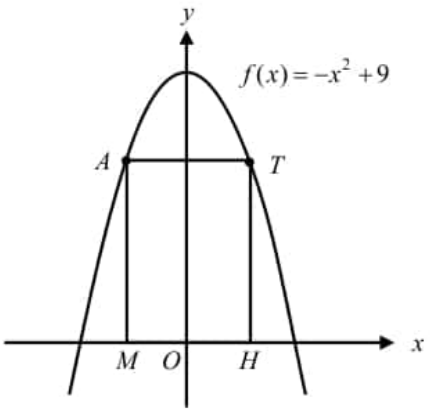
A) 25

B) 13

C) 11

D) 10

6



The graph of function f is shown in the xy-plane above. If length of $\overline{MA}$ of the rectangle $MATH$ is 5, what is the length of $\overline{AT}$?

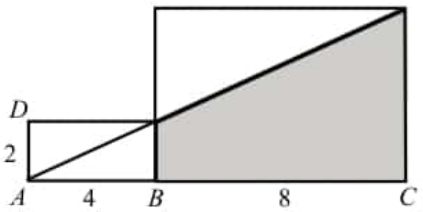
A) 2

B) 2.5

C) 3

D) 4

7



Two rectangles are shown in the figure above. If $AB=4$, $AD=2$, and $BC=8$, what is the area of the shaded region?

A) 32

B) 36

C) 48

D) 64

8

$$ax-by=9$$
$$3x+y=3$$

If the system of linear equations above has infinitely many solutions, what is the value of $a+b$?

A) –3

B) 6

C) 9

D) 12

9

x	$g(x)$
-3	6
-2	0
0	-6
2	-2
3	0
4	6

The function g is defined by a polynomial. Some selected values of x and $g(x)$ are shown in the table above. Which of the following is true?

I. $(x-3)$ is a factor of $g(x)$.

II. $(x-2)$ is a factor of $g(x)$.

III. $(x+2)$ is a factor of $g(x)$.

A) I and II only

B) I and III only

C) II and III only

D) I, II, and III

10

If y is inversely proportional to x^2, and $y=10$ when $x=2$, what is the value of y when $x=10$?

A) $\frac{2}{5}$

B) 2

C) 50

D) 250

11

$$y=k(x-4)(x+2)$$

The graph of the quadratic equation above, where k is a constant, has a vertex at point (a, b) in the xy-plane. Which of the following is equal to a?

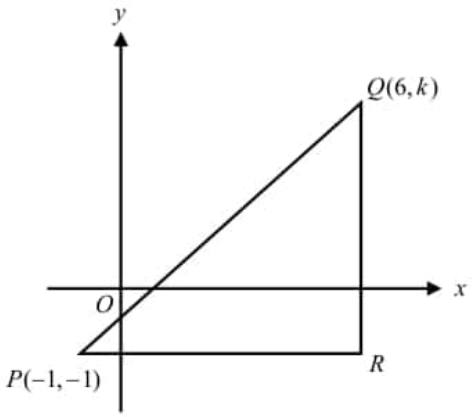
A) -1

B) 0

C) 1

D) 2

12



The figure PQR in the xy-plane is an isosceles right triangle. Which of the following is equal to k?

A) 6

B) 7

C) 8

D) 9

13

$$\frac{2i}{1-i} = a + bi$$

If $i = \sqrt{-1}$ in the equation above, where a and b are constants, what is the value of a?

A) -1

B) 1

C) 2

D) 3

14

$$\frac{1}{x} = \frac{x}{2x+1}$$

What are the solutions to the equation above?

A) $x = -1 \pm \sqrt{2}$

B) $x = 1 \pm \sqrt{2}$

C) $x = 1 \pm \sqrt{3}$

D) $x = \frac{1 \pm \sqrt{2}}{2}$

15

$$P = \frac{9}{2}K + 40$$

The equation above shows how the value of P relates to the value of K. Based on the equation, which of the following must be true?

I. When the value of K increases by 1, the value of P increases by 40.

II. When the value of K increases by 2, the value of P increases by 9.

III. When the value of K increases by 4, the value of P increases by 18.

A) I and II only

B) I and III only

C) II and III only

D) I, II, and III

16

$$x^2 - ax = -10$$

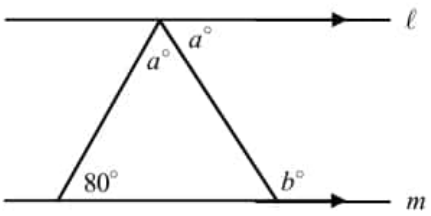
The quadratic equation above has two real solutions. If one of the solutions is 5 and a is a constant, what is the other solution?

17

$$\frac{15}{x-1} - 7 = 3 - \frac{5}{x-1}$$

If $x > 1$, what is the solution to the equation above?

18

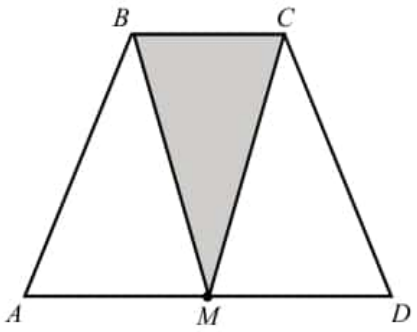


In the figure above, line ℓ is parallel to line m. What is the value of b?

19

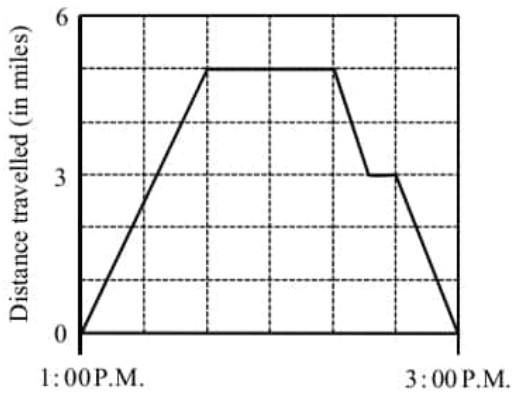
At a certain party, an executive committee provided one soda for 8 people, one large bag of chips for 4 people, and one cheese cake for 6 people. If the total number of sodas, large bag of chips, and cheese cakes was 78, how many people were at the party?

20



The figure above shows trapezoid $ABCD$. If M is the midpoint of $\overline{AD}$ and $AD = 3 \cdot BC$, what fraction of the area of the trapezoid is shaded?

1



Bernard began to ride a bicycle to the town library, and then rode to the book store to buy a novel. After 10 minutes, he began to ride home again. If the graph above shows his trip, how long did he stay in the library?

A) 10 minutes

B) 20 minutes

C) 30 minutes

D) 40 minutes

2

If $\frac{2}{k} = 9$ and $9k + h = 20$, what is the value of h?

A) 9.5

B) 12

C) 15.5

D) 18

3

n	-1	0	1	2	a
$f(n)$	0	3	6	9	b

The table above shows some values of the linear function f. Which of the following defines b?

A) $b = a + 3$

B) $b = a + 5$

C) $b = 2a + 4$

D) $b = 3a + 3$

4

	Subject		Total
Gender	Art	Music	
Males	30		65
Females		20	
Total			100

The incomplete table above shows the results of a survey about subject preference given to 100 students. What is the probability of art students being females?

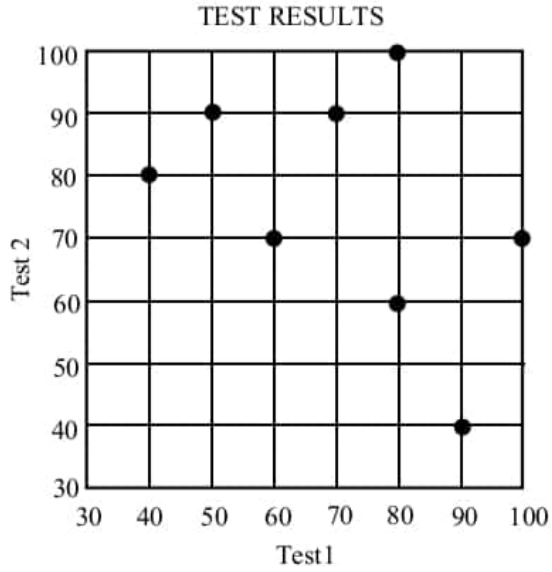
A) $\frac{7}{25}$

B) $\frac{1}{3}$

C) $\frac{1}{4}$

D) $\frac{2}{5}$

Questions 5 and 6 refer to the following information.



The scatterplot above relates two sets of data on a graph and shows the results of a class of students' last two algebra tests. Both the vertical and horizontal axes show the scores.

5

What is the average (arithmetic mean) score for Test 1?

A) 68.35
B) 70.50
C) 71.25
D) 74.75

6

Which of the following is the greatest change in scores between test 1 and test 2?

A) 60
B) 50
C) 40
D) 30

7

$$L = 0.2(t - 2010) + 10$$

The lifespan of a certain bird has been tracked from the year 2010, and the average lifespan is modeled by the equation above. In 2010 the lifespan of the bird was 10 years. What is the meaning of the number 0.2 in the equation?

A) The lifespan in the year 2010
B) The life span increase each year from 2010
C) The lifespan increase every 10 year
D) The life span decrease each year from 2010

8

$$x^2 - 2x + y^2 + 2y - 3 = 0$$

The equation of a circle in the xy-plane is shown above. What is the diameter of the circle?

A) $\sqrt{5}$
B) $2\sqrt{5}$
C) 5
D) 10

9

$$x - 4y = -3$$
$$4x - y = 12$$

In the system of equations above, what is the value of $x + y$?

A) 5

B) 6

C) 8

D) 9

10

$$\left(a^k\right)^{\frac{2}{3}} = \frac{1}{a^2}$$

In the equation above, if $a > 0$, what is the value of k?

A) -3

B) -1

C) 1

D) 3