Name: **Key**

11. Libby eats oatmeal, pancakes, or eggs, and she drinks apple juice or orange juice. If she picks a food and a drink at random, what is the probability that she will have oatmeal and apple juice?

A $\frac{1}{3}$

B $\frac{1}{5}$

C $\frac{1}{6}$

D $\frac{1}{8}$

$3 \cdot 2$

$\frac{1}{3} \cdot \frac{1}{2}$

12. There are 12 marbles in a bag. Of these, Four of them are blue and the rest are green. You reach into the bag and take out two marbles without looking. What is the probability that both marbles are blue? Round to the nearest whole percent.

4B
8G

$\frac{4}{14} \cdot \frac{3}{12} = \frac{1}{11}$

$\frac{1}{11}$

9%

13. The mean on a statewide biology test was 76 with a standard deviation of 11. One county within the state sampled the scores of some of its students and reported a mean of 80 with a margin of error of ±2.3. What is the range of reasonable means for the county's sample?

65 76 87
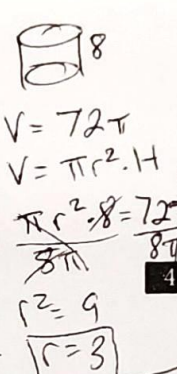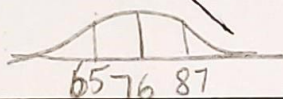
14. A game company gave customers one game to test and asked whether they would recommend the game. What is the probability that a customer who recommended their game tested Game A? Round to the nearest whole percent.

	Game A	Game B	Total
Would Recommend	43	38	81
Would Not Recommend	7	12	19

P(Rec | Game A) or P(Game A | Rec)

$\frac{43}{50}$ $\frac{43}{81} = 53\%$

1

If $\frac{x-1}{3} = k$ and $k = 3$, what is the value of x ?

A) 2
B) 4
C) 9
D) 10

$\frac{x-1}{3} = 3$

$x - 1 = 9$

$x = 10$

2

For $i = \sqrt{-1}$, what is the sum $(7 + 3i) + (-8 + 9i)$?

A) $-1 + 12i$
B) $-1 - 6i$
C) $15 + 12i$
D) $15 - 6i$

$7 + -8 + 3i + 9i$

$-1 + 12i$

3

On Saturday afternoon, Armand sent m text messages each hour for 5 hours, and Tyrone sent p text messages each hour for 4 hours. Which of the following represents the total number of messages sent by Armand and Tyrone on Saturday afternoon?

A) $9mp$
B) $20mp$
C) $5m + 4p$
D) $4m + 5p$

$5 \cdot m + 4p$

8

$V = 72\pi$

$V = \pi r^2 \cdot H$

$\frac{\pi r^2 \cdot 8}{8\pi} = \frac{72\pi}{8\pi}$

$r^2 = 9$

$r = 3$

diameter
= 6 yds

4

Kathy is a repair technician for a phone company. Each week, she receives a batch of phones that need repairs. The number of phones that she has left to fix at the end of each day can be estimated with the equation $P = 108 - 23d$, where P is the number of phones left and d is the number of days she has worked that week. What is the meaning of the value 108 in this equation?

A) Kathy will complete the repairs within 108 days.
B) Kathy starts each week with 108 phones to fix.
C) Kathy repairs phones at a rate of 108 per hour.
D) Kathy repairs phones at a rate of 108 per day.

1. Of the solutions for $3x^3 + 4x^2 - 5x = 0$, which has the greatest value?

$-x(3x^2 + 4x - 5) = 0$

A. 0

B. $\dfrac{-2+\sqrt{19}}{3}$

C. $\dfrac{-2-\sqrt{19}}{3}$

D. $\dfrac{-2+2\sqrt{19}}{3}$

$\dfrac{-4 \pm \sqrt{4^2 - 4(3)(-5)}}{2(3)}$ $4 \cdot 19$

$\dfrac{-4 \pm \sqrt{16+60}}{6} = \dfrac{-4 \pm \sqrt{76}}{6}$

$\dfrac{-4 \pm 2\sqrt{19}}{6}$

10.

$x - 12 = \sqrt{x+44}$

What are the solutions x of the given equation?

Answer the following:

$(x-12)^2 = x+44$

A. $(-5, 20)$ B. $(5, 20)$ $x^2 - 24x + 144 = x + 44$

$x^2 - 25x + 100 = 0$

2. C. 5   D. 20 $(x-20)(x-5) =$
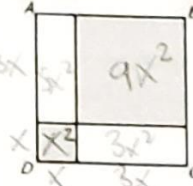
6. If square ABCD has area 25, and the area of the larger shaded square is 9 times the area of the smaller shaded square, what is the length of one side of the smaller shaded square?

Note: Figure not drawn to scale

$3x^2 + 9x^2 + 3x^2 + x^2 = 25$

$18x^2 = 25$

$x^2 = \dfrac{25}{16}$

A. 5/3   B. 5/4 $x = \dfrac{5}{4}$

C. 6/5   D. 5/3

5. If the circle with center O has area 9π, what is area of equilateral triangle AB

$A = \pi r^2$ 30   60   90

$9\pi = \pi r^2$ X   X$\sqrt{3}$ 2X

$9 = r^2$

$3 = r$

$\dfrac{X = \sqrt{3} = 6}{\sqrt{3} \cdot 0 \quad \sqrt{3}}$

$X = \dfrac{6}{\sqrt{3}}$

A. 18   B. $12\sqrt{6}$

C. $12\sqrt{3}$ D. 36

$\left(\dfrac{6}{\sqrt{3}} + \dfrac{6}{\sqrt{3}}\right) 6$

$\dfrac{1}{2} \cdot \dfrac{12}{\sqrt{3}} \cdot 6 = \dfrac{172\sqrt{3}}{2\sqrt{3} \cdot \sqrt{3}}$

$\dfrac{72\sqrt{3}}{6}$

6. Define f and g as follows:

$$f(x) = \begin{cases} x+2, & x < 0 \\ 4-x, & x \geq 0 \end{cases}$$

$$g(x) = \begin{cases} 4x, & x < 3 \\ 3x, & x \geq 3 \end{cases}$$

Evaluate $(f \circ g)(3)$.

Answer the following:

A. -5   B. 14

C. -8   D. 11

$f(g(3))$

$f(3(3))$

$f(9)$

$4 - 9 = -5$

3.

7. Solution X is 10 percent alcohol by volume, and solution Y is 30 percent alcohol b many milliliters of solution Y must be added to 200 milliliters of solution X to create a solution that is 25 percent alcohol by volume?

Answer the following:

$.10(200) + .30y = .20(y+200)$

$20 + 0.3y = .20y + 40$

$0.10y = 20$

$y = 200$

A. 200   B. 500/3

C. 600   D. 480

4.

9. A computer can perform c calculations in s seconds. How many minutes will it take the computer to perform k calculations?

Answer the following:

A. 60c/ks   B. 60ks/c

C. ks/c   D. ks/60c

K calc $\cdot \dfrac{S\,sec}{C\,calc} \cdot \dfrac{1\,min}{60\,sec}$

$\dfrac{K \cdot S}{60C}$

7.

$(x^2 + bx - 2)(x+3) = x^3 + 6x^2 + 7x - 6$

In the equation above, b is a constant. If the equation is true for all values of x, what is the value of b?

Answer the following:

$x^3 + 3x^2 + bx^2 + 3bx - 2x - 6$

A. 7   B. 2

C. 9   D. 3

$6x^2 = 3x^2 + bx^2$ $7x = 3bx - 2x$

$3 = b$ $9x = 3bx$

$b = 3$

8.

$y^3 - 2y^2 - cxy + 6x$

In the polynomial above, c is a constant. If the polynomial is divisible by $y - 2$, what is the value of c?

Answer the following:

$y^3 - 2y^2 - 3xy + 6x$

A. Can't be determined. $y^2(y-2) - 3x(y-2)$

B. 3

C. -12   D. 1

9. Which of the following is equivalent to $\left(\dfrac{1}{\sqrt{x}}\right)^n$?

A) $x^{\frac{n}{2}}$

B) $x^{-\frac{n}{2}}$

C) $x^{n+\frac{1}{2}}$

D) $x^{n-\frac{1}{2}}$

$\left(\dfrac{1}{x^{1/2}}\right)^n$

$\dfrac{1^n}{x^{\frac{n}{2}}} = \dfrac{1}{x^{n/2}} = x^{-\frac{n}{2}}$

Name:_____

16

If $t > 0$ and $t^2 - 4 = 0$, what is the value of t ?
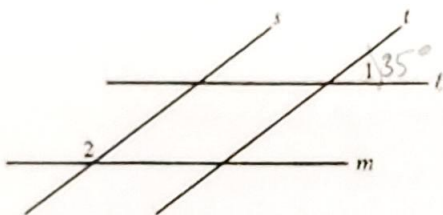
$(t+2)(t-2)=0$

$t \cancel{=} 2$ $\boxed{t = 2}$

2

If $y = kx$, where k is a constant, and $y = 24$ when $x = 6$, what is the value of y when $x = 5$?

A) 6 $24 = k(6)$
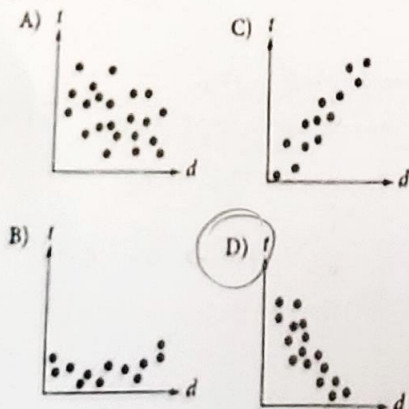
B) 15 $4 = k$

C) 20

D) 23 $y = 4(5)$

3

In the figure above, lines ℓ and m are parallel and lines s and t are parallel. If the measure of $\angle 1$ is $35°$, what is the measure of $\angle 2$?

A) 35°

B) 55° $180 - 35 = 145°$

C) 70°

D) 145°

5

Which of the following graphs best shows a strong negative association between d and t ?

A)

B)

C)

D)

17

A summer camp counselor wants to find a length, x, in feet, across a lake as represented in the sketch above. The lengths represented by AB, EB, BD, and CD on the sketch were determined to be 1800 feet, 1400 feet, 700 feet, and 800 feet, respectively. Segments AC and DE intersect at B, and $\angle AEB$ and $\angle CDB$ have the same measure. What is the value of x ?

1600 ft

4

If $16 + 4x$ is 10 more than 14, what is the value of $8x$?

A) 2 $16 + 4x = 10 + 14$ $8x$

B) 6 $4x = 8$ $8(2)$

C) 16 $x = 2$ 16

D) 80

8

For what value of n is $|n - 1| + 1$ equal to 0 ?

A) 0 $|n-1|+1 = 0$
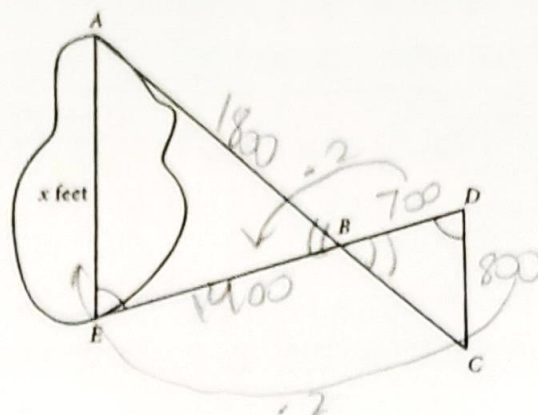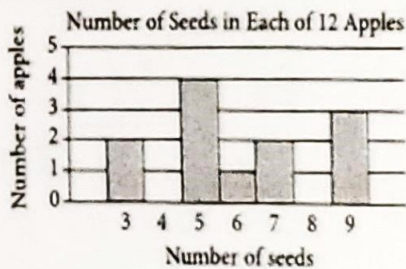
B) 1 $|n-1| = -1$

C) 2

D) There is no such value of n.

11

Which of the following numbers is NOT a solution of the inequality $3x - 5 \geq 4x - 3$?

A) −1 $-2 \geq x$

B) −2 $-2 \geq -1$ false $-2 < -1$

C) −3 $-2 \geq -3$ ✓

D) −5 $-2 \geq -5$ ✓

12

Number of Seeds in Each of 12 Apples

Based on the histogram above, of the following, which is closest to the average (arithmetic mean) number of seeds per apple?

A) 4 $\dfrac{3 \cdot 2 + 5 \cdot 4 + 6 \cdot 1 + 7 \cdot 2 + 9 \cdot 3}{12}$

B) 5

C) 6 $\dfrac{6 + 20 + 6 + 14 + 27}{12}$

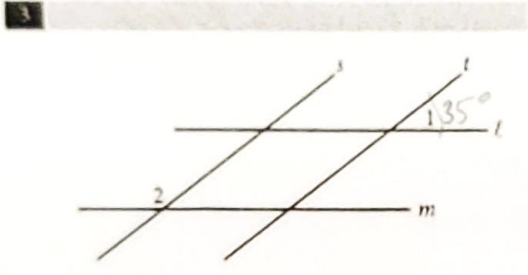D) 7 $\dfrac{73}{12} = 6.08$

Name:_____

16

If $t > 0$ and $t^2 - 4 = 0$, what is the value of t ?

$(t+2)(t-2)=0$

$t \cancel{=} 2$ $\boxed{t=2}$

2

If $y = kx$, where k is a constant, and $y = 24$ when $x = 6$, what is the value of y when $x = 5$?
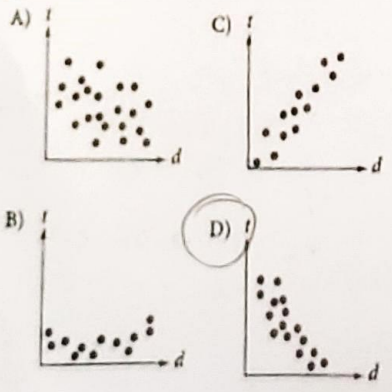
A) 6 $24 = k(6)$

B) 15 $4 = k$

C) 20

D) 23 $y = 4(5)$

3

In the figure above, lines ℓ and m are parallel and lines s and t are parallel. If the measure of $\angle 1$ is $35°$, what is the measure of $\angle 2$?

A) 35° $180 - 35 = 145°$

B) 55°

C) 70°

D) 145°

5

Which of the following graphs best shows a strong negative association between d and t ?
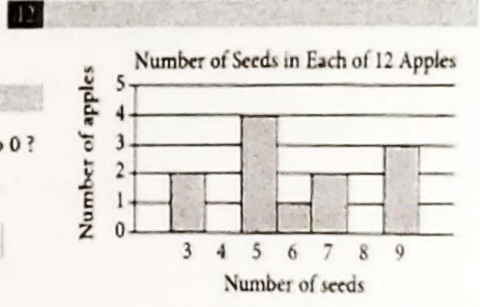
A)

B)

C)

D)

17

A summer camp counselor wants to find a length, x, in feet, across a lake as represented in the sketch above. The lengths represented by AB, EB, BD, and CD on the sketch were determined to be 1800 feet, 1400 feet, 700 feet, and 800 feet, respectively. Segments AC and DE intersect at B, and $\angle AEB$ and $\angle CDB$ have the same measure. What is the value of x ?

$1600 \ ft$

4

If $16 + 4x$ is 10 more than 14, what is the value of $8x$?

A) 2 $16 + 4x = 10 + 14$ $8x$

B) 6 $4x = 8$ $8(2)$

C) 16 $x = 2$ 16

D) 80

8

For what value of n is $|n - 1| + 1$ equal to 0 ?

A) 0 $|n-1|+1=0$

B) 1 $|n-1|=-1$

C) 2

D) There is no such value of n.

11

Which of the following numbers is NOT a solution of the inequality $3x - 5 \geq 4x - 3$?

A) −1 $-2 \geq x$

B) −2 $-2 \geq -1$ false $-2 < -1$

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12

Number of Seeds in Each of 12 Apples

Based on the histogram above, of the following, which is closest to the average (arithmetic mean) number of seeds per apple?

A) 4 $3 \cdot 2 + 5 \cdot 4 + 6 \cdot 1 + 7 \cdot 2 + 9 \cdot 3$

B) 5   ─────────────────────────

C) 6   12

D) 7 $\dfrac{6 + 20 + 6 + 14 + 27}{12}$

$\dfrac{73}{12} = 6.08$

Name:_____

5

$(x^2y - 3y^2 + 5xy^2) - (-x^2y + 3xy^2 - 3y^2)$

Which of the following is equivalent to the expression above?

(handwritten: $2x^2y + 0y^2 + 2xy^2$)

A) $4x^2y^2$

B) $8xy^2 - 6y^2$

C) $2x^2y + 2xy^2$ *(circled)*

D) $2x^2y + 8xy^2 - 6y^2$

6

$h = 3a + 28.6$

A pediatrician uses the model above to estimate the height h of a boy, in inches, in terms of the boy's age a, in years, between the ages of 2 and 5. Based on the model, what is the estimated increase, in inches, of a boy's height each year?

A) 3   *(circled)*

B) 5.7

C) 9.5

D) 14.3

(handwritten: 3 is slope so constant increase)

8

If $\dfrac{a}{b} = 2$, what is the value of $\dfrac{4b}{a}$?

A) 0   *(handwritten: a=2b)*

B) 1

C) 2   *(circled)*

D) 4

(handwritten: $\frac{4b}{2b} = \frac{4}{2} = 2$)

9

$3x + 4y = -23$

$(2y - x = -19)$ 3

What is the solution (x, y) to the system of equations above?

A) $(-5, -2)$

B) $(3, -8)$ *(circled)*

C) $(4, -6)$

D) $(9, -6)$

(handwritten:
$3x + 4y = -23$
$-3x + 6y = -57$
$10y = -80$
$y = -8$ *)*

10

$g(x) = ax^2 + 24$

For the function g defined above, a is a constant and $g(4) = 8$. What is the value of $g(-4)$?

A) 8   *(circled)*

B) 0

C) -1

D) -8

(handwritten:
$g(4) = a(4)^2 + 24 = 8$
$16a = -16$
$a = -1$
$g(-4) = -1(-4)^2 + 24$
$-1 \cdot 16 + 24$
$-16 + 24 = 8$ *)*

11

$b = 2.35 + 0.25x$

$c = 1.75 + 0.40x$

In the equations above, b and c represent the price per pound, in dollars, of beef and chicken, respectively, x weeks after July 1 during last summer. What was the price per pound of beef when it was equal to the price per pound of chicken?

A) $2.60

B) $2.85

C) $2.95

D) $3.35   *(circled)*

(handwritten:
$2.35 + 0.25x = 1.75 + 0.40x$
$0.6 = 0.15x$
$4 = x$
$b = 2.35 + 0.25(4)$
$= 3.35$ *)*

12

A line in the xy-plane passes through the origin and has a slope of $\dfrac{1}{7}$. Which of the following points lies on the line?

A) $(0, 7)$

B) $(1, 7)$

C) $(7, 7)$

D) $(14, 2)$ *(circled)*

(handwritten:
$y = \frac{1}{7}x + 0$
$y = \frac{1}{7}(0) + 0 = 0$
$y = \frac{1}{7}(7) + 0 = 1$
$y = \frac{1}{7}(1) + 0 = \frac{1}{7}$
$y = \frac{1}{7}(14) + 0 = 2$ *)*

14

If $3x - y = 12$, what is the value of $\dfrac{8^x}{2^y}$?

A) 2^{12} *(circled)*

B) 4^4

C) 8^2

D) The value cannot be determined from the information given.

(handwritten:
$\frac{(2^3)^x}{2^y} = \frac{2^{3x}}{2^y} = 2^{3x-y}$
$= 2^{12}$ *)*

15

If $(ax + 2)(bx + 7) = 15x^2 + cx + 14$ for all values of x, and $a + b = 8$, what are the two possible values for c ?

A) 3 and 5

B) 6 and 35

C) 10 and 21

D) 31 and 41   *(circled)*

(handwritten:
$abx^2 + 7ax + 2bx + 14$
$15x^2 \qquad cx \qquad +14$
$ab = 15 \qquad 7a + 2b = c$
$a = \frac{15}{b}$
$7(3) + 2(5) = c \qquad 7(5) + 2(3) = c$
$31 = c \qquad 41 = c$
$\frac{15}{b} + b^2 = 8$
$15 + b^2 = 8b \to b^2 - 8b + 15 = 0$
$(b - 5)(b - 3) = 0$
$b = 5 \quad b = 3$
$a = 3 \quad a = 5$ *)*

19

In a right triangle, one angle measures $x°$, where $\sin x° = \dfrac{4}{5}$. What is $\cos(90° - x°)$?

(handwritten: $\sin x = \cos(90 - x) = \boxed{\frac{4}{5}}$ *)*

20

If $a = 5\sqrt{2}$ and $2a = \sqrt{2x}$, what is the value of x ?

(handwritten:
$2(5\sqrt{2}) = \sqrt{2x}$
$(10\sqrt{2})^2 = (\sqrt{2x})^2$
$100 \cdot 2 = \frac{2x}{2}$
$\boxed{x = 100}$ *)*

Algebra 2 SAT practice #2

1. The art club has a budget of $350 for art supplies. The club has already purchased a display board for $125 and would like to buy several canvases. The canvases are $15 each. How many canvases can the club buy? Let x represent the number of canvases. Which inequality can be used to find x?

A $350 > 125 - 15x$ B $350 < 125 + 15x$

C $350 \geq 125 + 15x$ D $350 \leq 125 - 15x$

2.

x	-2	-1	0	1	2
f(x)	0.25	1	4	16	64

Given the table, determine the equation of the function.

A $y = 4(\frac{1}{4})^x$ B $y = 2(x-1)^2 + 16$

C $y = 4(4)^x$ D $y = 4(x-0)^2 + 4$

3.

x	f(x)
0	3
1	10
2	17
3	24
4	31

Write the function rule to represent the table.

A $y = 7x + 3$ B $y = 3(7)^x$

C Not a function   D $y = 7(3)x^{-1}$

4.

Plot these points on a graph. What kind of function does it make?

$(-3, 10)$; $(-2, 5)$; $(-1, 2)$; $(0, 1)$; $(1, 2)$; $(2, 5)$ $(3, 10)$

A Linear   B Quadratic

C Exponential

5.

What is the range of this function?

A $(-\infty, +\infty)$ B $(-\infty, 3)$

C $[-3, +\infty)$ D $(-\infty, 3]$

7. Solve the system of equations by elimination.
$\begin{cases} -x + y = -13 \\ -8x - 4y = -8 \end{cases}$

$-4x + 4y = -52$
$+ -8x - 4y = -8$
$-12x = -60$
$x = 5$
$-5 + y = -13$
$y = -8$

A $(-5, -18)$ B $(5, 8)$
C $(-5, 8)$ D $(5, -8)$

10.

	Spanish	French	German	Total
Boys	10	2	8	20
Girls	15	12	3	30
Total	25	14	11	50

What is the probability that the person picked will be a boy given they speak german?

A .16 $\frac{8}{11}$ B .4

C .22   D .7273

12. Mario had 102 dollars to spend on 9 books. After buying them he had 21 dollars. How much did each book cost?

$102 = 9x + 21$
$81 = 9x$
$9 = x$

A $11   B $10
C $9   D $8

13. Last month, Kyeisha made $480 working for 30 hours. This month, she will get a 15% increase in the amount she earns per hour. What will be her hourly rate, in dollars per hour, after the raise?

A $15.00   B $2.40
C $480   D $18.40

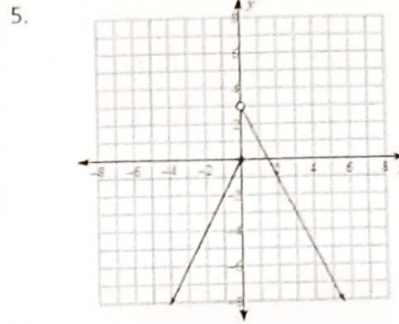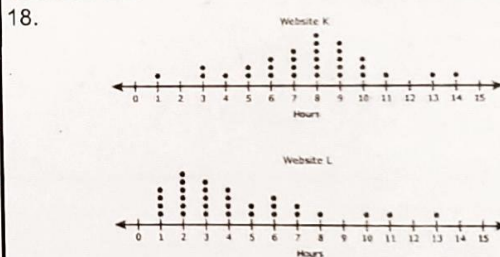$480 = 30x$ $16 \cdot 1.15 = 18.4$
$16 = x$

18. The dot plots below show the numbers of hours teenagers spent on two different websites last week.

Which statement is best supported by the data in the dot plots?

F. The mode of the data for Website K is greater than the mode of the data for Website L.

G. The range of the data for Website L is equal to the range of the data for Website K.

H. The distribution of data for Website L is symmetrical.

J. The distribution of data for Website K is skewed to the left.

6.
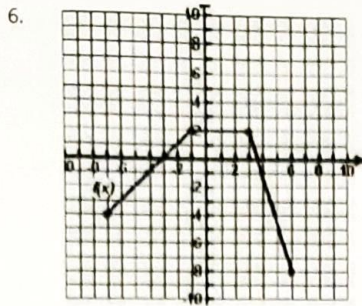
What is the DOMAIN of the function?

A. [-7, 6]   B. (-7, 6)

C. [-8, 2]   D. [-7, -8]

---

15. Josh is thinking of two numbers. Their sum is -10 and their difference is -2. Which system of equations represents the situation?

$x + y = -10$

$x - y = -2$

A. $x = -2$, $y = 5$

B. $x + y = -2$, $x - y = -10$

C. $x - y = -10$, $x + y = -2$

D. $x + y = -10$, $x - y = -2$

---

8. Alexandra finds that she can give 3 haircuts and 2 hair dyes in 315 minutes. Giving 2 haircuts and 4 hair dyes takes 450 minutes. Which system of equations represents the situation?

$3x + 2y = 315$

$2x + 4y = 450$

A. $3x + 2y = 450$, $2x + 4y = 315$

B. $2x + 2y = 315$, $3x + 4y = 450$

C. $3x + 2y = 315$, $2x + 4y = 450$

---

9. When you are trying to find the MEDIAN of a set of data and 2 numbers are left in the middle after putting them in order from least to greatest, what do you do?

A. Subtract the 2 numbers   B. Pick the one you want

C. Add the 2 numbers and divide by 2   D. List both numbers as the median

---

11. Bag A contains 9 red marbles and 3 green marbles. Bag B contains 9 black marbles and 6 orange marbles. Find the probability of selecting one green marble from bag A and one black marble from bag B.

$\frac{3}{12} \cdot \frac{9}{15}$ → $\frac{3}{20}$

A. 2/27   B. 3/20

C. 3/31   D. 1/4

---

17. A dolphin jumps from the water at at initial velocity of 16 feet per second. The equation **h = -16t² + 80t** models the dolphin's height at any given time, t. What is the maximum height the dolphin jumps?

$\frac{-80}{2(-16)} = 2.5$

$-16(2.5)^2 + 80(2.5)$

100

A. 1 foot   B. 96 feet

C. 5 feet   D. 100 feet

---

16. The height of an object thrown into the air can be modeled by the formula $y = -16x^2 + 70x + 95$, where y is in feet after x seconds.

What is the height of the object after 5 seconds?

$y = -16(5)^2 + 70(5) + 95$

$y = 45$

A. 171.56 feet   B. 45 feet

C. 95 feet   D. 70 feet

19.

$f(x) = 2x^2 - 5x$

$g(x) = 3x^3$

f(x-2)

$2(x-2)^2 - 5(x-2)$

$2(x^2 - 4x + 4) - 5x + 10$

$2x^2 - 8x + 8 - 5x + 10$

$2x^2 - 13x + 18$

A. $2x^2 - 13x + 2$ B. $2x^2 - 8x + 3$

C. $2x^2 - 13x + 18$ D. $2x^2 - 5x + 18$

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20. Given that $f(x) = x^2 + x$ and $g(x) = 3x + 1$, find the value of $f(g(4))$.

$f(13) = 13^2 + 13$ $g(4) = 3(4) + 1$

$169 + 13$ $g(4) = 13$

182

A. 61   B. None of the Above

C. 40   D. 182

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14. The ratio of cups of sugar to cups of flour needed to back cookies is 1:5. If Myesha uses 25 cups of flour, how much sugar is needed?

$\frac{1}{5} = \frac{x}{25}$

$5x = 25$

$x = 5$

A. 125 cups   B. 10 cups

C. 5 cups   D. 15 cups