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Unit 3 Linear Equations HONORS

Study Guide

1.) For $f(x) = 2x - 6$ what is the value of $f(-5) + 1$?

$2(-5)-6$

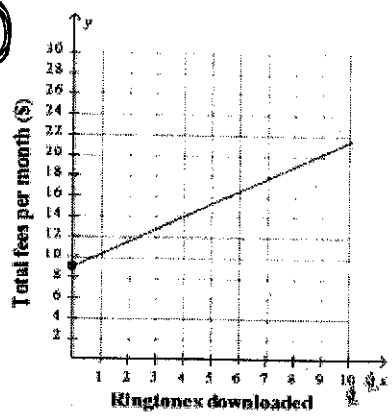
$-10+1$

$f(-5)+1=-15$

2.) A ringtone company charges \$9 per month for the service fee plus \$1.25 for each ringtone downloaded. What is the graph of the equation that models the fees per month?

$y=1.25x+9$

a.



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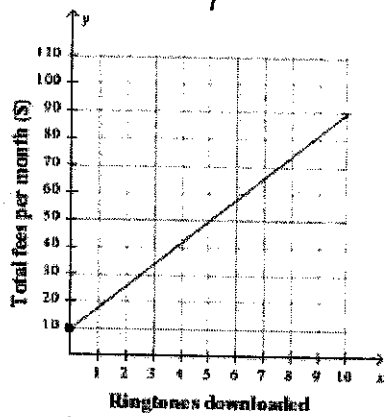

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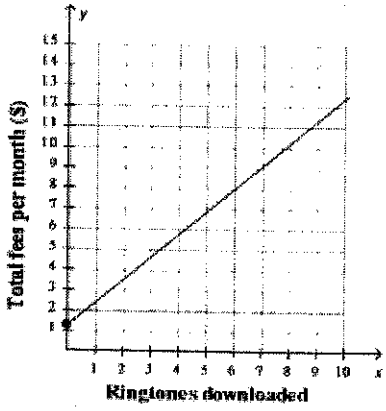

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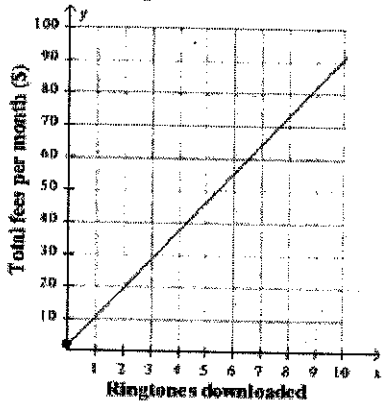


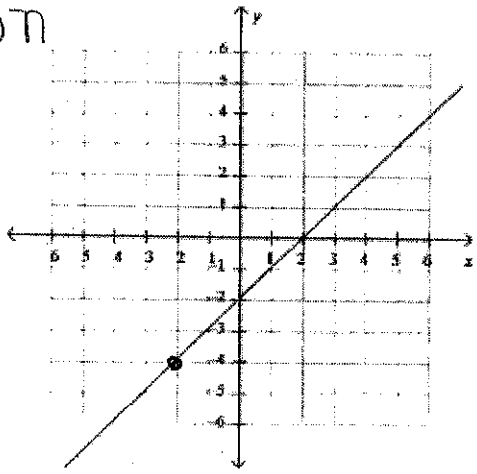
3.) Given the graph below, what is the value of $f(-2)$?

$f(x) \rightarrow$ function graphed

$f(-2)$

$\hookrightarrow x=-2$

$f(-2)=-4$



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4.) A newspaper editor tracked the number of new subscribers to the newspaper each week in the table below. What is the average rate of change in the number of subscribers between weeks 1 and 3?

Week	1	2	3	4
New Subscribers	202	225	276	379

$\frac{276-202}{3-1} = \frac{74}{2}$ 37 SUBSCRIBERS PER WEEK

5.) The graph of a linear function passes through the points (4,5) and(6,11). Which is an equation of the function?

$m = \frac{11-5}{6-4} = \frac{6}{2}$

$m = 3$

A. $f(x) = \frac{1}{3}x + \frac{11}{3}$

B. $f(x) = \frac{1}{3}x - \frac{11}{3}$

C. $f(x) = 3x - 7$

D. $f(x) = 3x + 7$

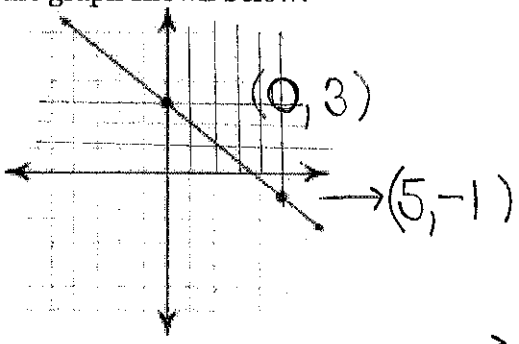
$y - 5 = 3(x-4)$

$y - 5 = 3x - 12$

$y = 3x - 7$

6.) Which choice is a correct equation for the graph shown below?

$m = \frac{-1-3}{5-0} = \frac{-4}{5}$



A. $x + y = 3$

B. $x - y = -3$

C. $5x + 4y = 12$

D. $4x + 5y = 15$

$\frac{4y}{4} = \frac{-5x}{4} + \frac{12}{4}$

$y = \frac{-5}{4}x + 3$

7.) An ordered pair is missing from the table below.

x	$f(x)$
−1	10
1	8
3	6
5	4
?	?

Write an ordered pair that would prevent the relation in the table from being a function.

Gany ordered pair with an x-value of −1, 1, 3, OR 5

8.) The function $f(x) = 4x + 12$ models the yearly membership cost for a movie rental club, where x is the number of movies rented.

- Last year, Sarah rented 24 movies.
- Last year, Tim rented twice the amount of movies as Sarah.

How much more did Tim pay last year than Sarah?

S: $f(24) = 4(24) + 12 = 108$

T: $f(48) = 4(48) + 12 = 204$

$90

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9.) What are the intercepts of the equation $f(x) = \frac{1}{3}x + 3$?

x-int when y=0

$0 = \frac{1}{3}x + 3$

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

x-int (-9,0)

y-int (0,3)

10.) A sequence is generated the explicit formula $a_n = 7n + 4$. What is the value of the eighth term?

$a_n = 7(n-1)+11$

$a_1 = 11$

$a_8 = 7(8-1)+11$

$a_8 = 60$

11.) A soccer camp charges $120 per camper for 12 campers. When a team brings 18 campers, the rate is reduced to $100 per camper. What is the rate of change in cost per camper?

A. $3.33 B. $12.00

C. $5.55 D. $20.00

(12, 120)(18, 100)

$m = \frac{100-120}{18-12}$

$m = 3.33$

12.) Debra runs at a constant rate of speed. At the end of 15 minutes, she has run 2 miles. At the end of 45 minutes, she has run 6 miles. What is the equation that represents the number of miles she runs, n, in terms of the time she has run, t minutes?

(15, 2)(45, 6)

$m = \frac{6-2}{45-15} = \frac{4}{30}$

$n = .13t$

13.) In which function is the population, y, increasing by 65 each month, x?

A. $y = 65x + 100$ C. $y = 100x + 65$

B. $y = -65x + 100$ D. $y = \frac{1}{65x}$

14.) Which is the equation of the line that passes through the points $(-4, 3)$ and $(2, -6)$?

~~A.~~ $y = -\frac{3}{2}x + 3$ ~~C.~~ $y = \frac{3}{2}x + 3$

B. $y = -\frac{3}{2}x - 3$ ~~D.~~ $y = \frac{3}{2}x - 3$

$m = \frac{-6-3}{2-(-4)} = \frac{-9}{6} = \frac{-3}{2}$

15.) Which table of values represents a linear function? → constant rate

x	f(x)
-3	2.75
-2	4.25
-1	6
0	7.25

x	f(x)
5	8
8	23
9	28
11	38

x	f(x)
3	14
4	15
5	13
6	14

x	f(x)
-6	12
-5	10
-4	7.25
-3	5.4545

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16.) A 4-pound bag of popcorn costs \$7.00, and a 9-pound bag of popcorn costs \$15.75. Assuming the cost of popcorn follows a linear trend, how much would a 3-pound bag of popcorn cost?

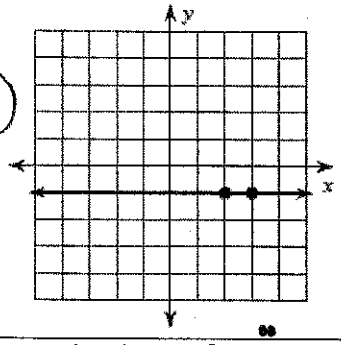
(4, 7) (9, 15.75)

$m = \frac{15.75-7}{9-4} = \frac{8.75}{5}$

$m = 1.75$

5.25 for 3lb bag

17.) Write the equation of the line graphed below.



$y = -1$

18.) Ashtyn is saving the same amount of money each week from babysitting. After 3 weeks, she saves \$105. After 5 weeks, she saves \$165. Which equation models the amount of money Ashtyn will have saved, y, after x weeks?

A. $y = 30x + 45$

B. $y = 30x + 15$

C. $y = 60x - 20$

D. $y = 60x + 45$

(3, 105) (5, 165)

$m = \frac{165-105}{5-3}$

$m = 60/2 = 30$

$y - 105 = 30(x-3)$

$y - 105 = 30x - 90$

$y = 30x + 15$

19.) While on vacation in Washington DC, the cab ride for the Dulles airport to the hotel is 15 miles and costs \$25.50. The cab driver charges \$1.50 per mile for the entire trip.

$m = 1.50$ (15, 25.50)

A. Write an equation to that can be used to determine how much a cab ride would cost anywhere in Washington DC.

$y - 25.50 = 1.50(x - 15)$

$y = 1.50x + 3$

B. What is the flat rate of the cab ride?

\$3.00

20.) The value of a house generally increases over time. Taylor buys a house for \$200, 000. After 1 year, the house is worth \$220, 000. After 2 years, the house is worth \$240, 000. After 3 years, the house is worth \$260, 000. Write a function that describes the relationship between the year and the house value.

$m = 20,000$

$b = 200,000$

$y = 20,000x + 200,000$

21.) What explicit equation represents the pattern in the table below?

x	y
-4	18
-1	9
3	-3
7	-15

A. $y = \frac{1}{3}x + 2$

B. $y = -\frac{1}{3}x + 3$

C. $y = 3x + 9$

D. $y = -3x + 6$

$m = \frac{9-18}{-1-(-4)} = \frac{-9}{3} = -3$

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22.) Given the equation and the table below, which of the following statements is true about functions $f(x)$ and $g(x)$?

$m = 3$

$f(x) = \frac{1}{6}x - 5$

$b = -5$

x	$g(x)$
−8	−18
−4	−6
4	18
8	30

−4 −6
−3 −3
−2 0
−1 3
0 6

A. The y-intercept of the function $f(x)$ is equal to the y-intercept of the function $g(x)$.

B. The y-intercept of the function $f(x)$ is greater than the y-intercept of the function $g(x)$.

C. The y-intercept of the function $f(x)$ is less than the y-intercept of the function $g(x)$.

D. The y-intercepts cannot be determined.

23.) The function $g(x) = 20x + 100$ model the balance of Liz's savings account after x weeks. What is the meaning of the slope in the function?

$m = 20$

A. The initial amount Liz starts with at the beginning of each year.

B. The initial amount in Liz's bank account.

C. The additional amount Liz saves each month.

D. The additional amount Liz saves each year.

24.) Compare the properties of each function.

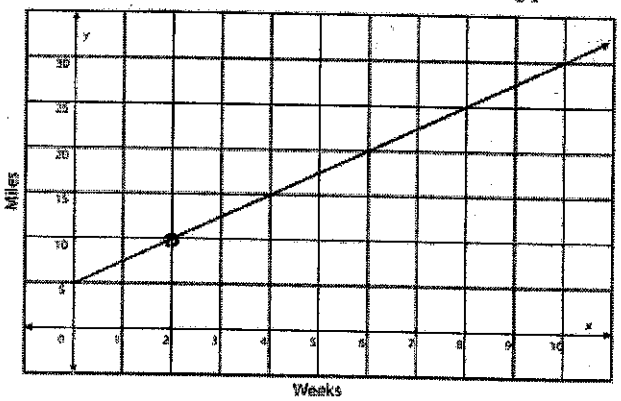
Function A

Sophie ran 8 miles last week and plans to run 2 miles each additional week.

$y = 2x + 8$

Function B

The following graph represents Kaelina's running plan.



$y = 2.5x + 5$

Which statement is true?

A. Sophie ran at a faster rate than Kaelina.

B. Sophie and Kaelina ran at equal rates.

C. Last week Sophie ran more miles than Kaelina.

D. Last week Sophie ran fewer miles than Kaelina.

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Unit 3 Linear Equations HONORS

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25.) Dave graphed the linear function with an x-intercept of 4 and y-intercept of -12. Which function did Dave graph?

~~A.~~ $y = -4x + 12$

B. $y = 4x - 12$

~~C.~~ $y = -3x + 12$

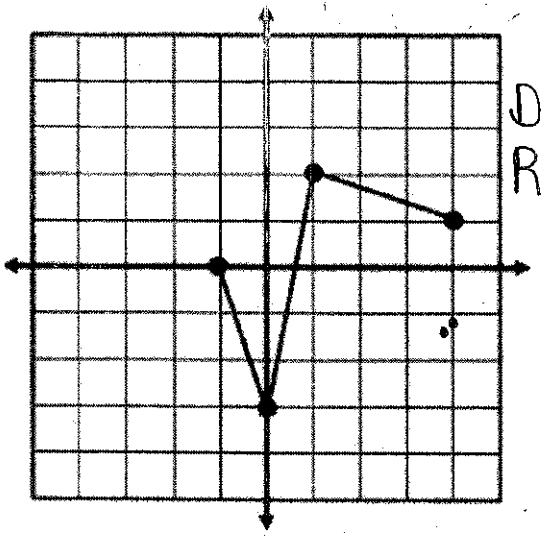
D. $y = 3x - 12$

$(4,0)(0,-12)$

$m = \frac{-12-0}{0-4} = \frac{-12}{-4}$

$m = 3$

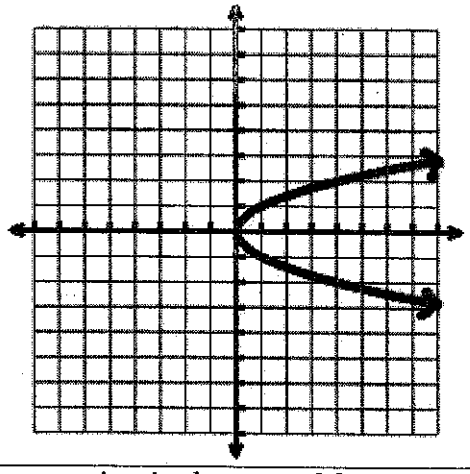
26.) Identify the domain and range of the function graphed below.



D: $-1 \le x \le 4$

R: $-3 \le y \le 2$

27.) Find the domain and range from the graph below.



D: $x \ge 0$

R: ARN

28.) Find the missing value so that the line passing through the points has the given slope.

$(15,8)$ *and* $(x,7)$; $m = \frac{1}{5}$

$\frac{7-8}{x-15} = \frac{1}{5}$

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

$x - 15 = -5$

$x = 10$

29.) A pattern exists in the sum of the interior angles of polygons. The sum of the interior angles of a triangle is 180°, of a quadrilateral is 360°, and of a pentagon is 540°. The pattern follows the function $a_n = a_{n-1} + 180$. What is the sum of the interior angles of a nonagon?

9 sides

# of sides	3	4	5	6	7	8	9
sum of int. angles	180	360	540	720	900	1080	1260

1260°

30.) Which function has the smallest rate of change over the interval $-2 \le x \le 4$?

$a = 2$ $b = 4$

A. $f(x) = 3x^2 - 12x + 5$ $\frac{5-(-7)}{2} = 6$

B. $f(x) = -x + 1$ $= -1$

C. $y = x^2 + 5x + 6$ $\frac{42-20}{2} = 11$

D. $y = 3(4)^x$

$\frac{768-192}{2} = 288$

$\frac{f(4)-f(2)}{4-2}$