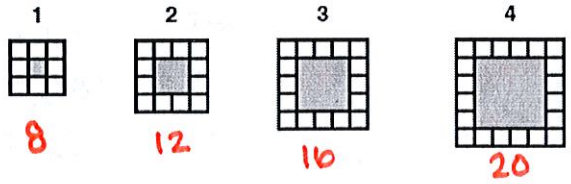
Linear Functions: EOC Prep

Name: _____

Spring 2013

Directions: The following questions are sample items similar to those found on the EOC Exam. Answer each to the best of your ability.

1. Mrs. Morris gave her students this pattern of white tiles:



She asked her students to write an equation to represent the number of white tiles, t, for any figure number, n.

Which equation represents the number of white tiles in the pattern?

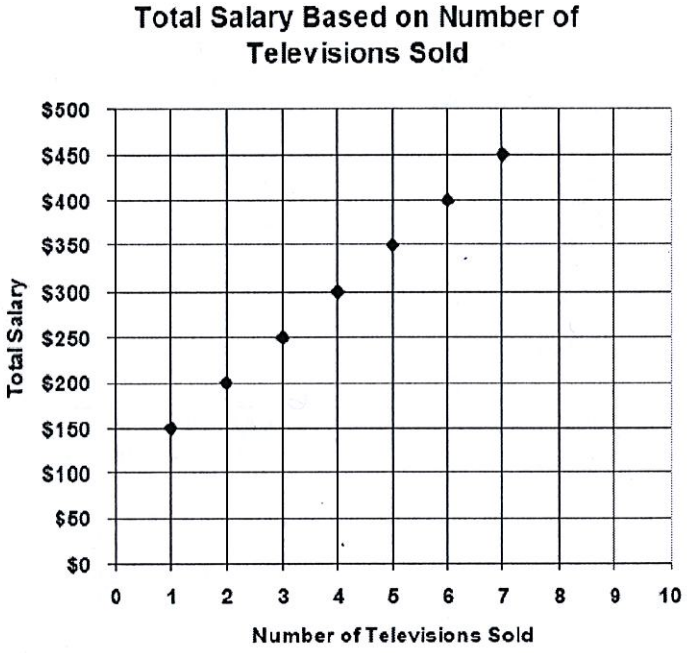
- o A. $t = n + 2$
- o B. $t = n + 4$
- ● C. $t = 4n + 4$
- o D. $t = 4n + 8$

$y = 4x + 4$

x	y	
0	4	← y-int.
1	8	
2	12	+4
3	16	+4
4	20	

change is slope

2. The chart shows the amount of total salary (commission plus base salary) paid to employees of a store that specializes in big screen televisions.



$m = \frac{50}{1}$

$b = 100$

$y = 50x + 100$

Which equation best represents the total salary (T) that an employee makes for selling any number of television sets (n)?

- ● A. $T = 50n + 100$
- o B. $T = 100(n + 50)$
- o C. $T = 100n + 50$
- o D. $T = 50(n + 100)$

3. A school purchases boxes of candy bars.

- Each box contains 50 candy bars.
- Each box costs $30.

How much does the school have to charge for each candy bar to make a profit of $10 per box?

A $0.40 $(0.4)(50) = \$20 - 30 = -10$

B $0.50 $(0.5)(50) = \$25 - 30 = -5$

C $0.80 $(0.8)(50) = \$40 - 30 = 10$ ← profit!

D $1.25 $(\$1.25)(50) = \$62.50 - 30 = 32.50$

$1.25 \times 50 = 62.50$

4. *Which equation is equivalent to $y + 2(x + 5) = 4x + 5$

a) $y = 2x + 20$

b) $y = -4x + 5$

c) $y = 2x - 5$

d) $y = 5x + 2$

$y + 2x + 10 = 4x + 5$

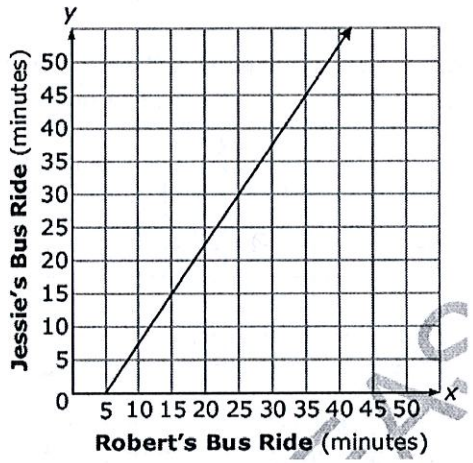
$y + 10 = 2x + 5$

$y = 2x - 5$

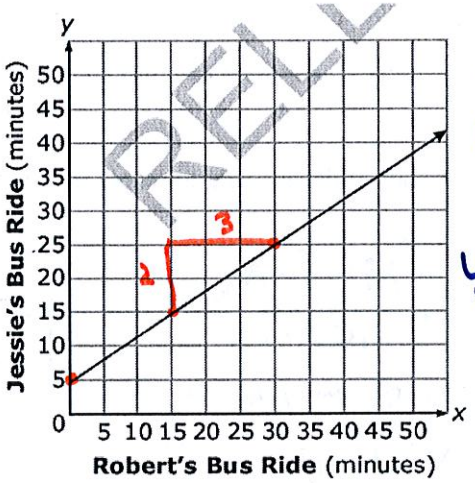
5. * Jessie's bus ride to school is 5 minutes more than $\frac{2}{3}$ the time of Robert's bus ride.

Which graph shows the possible times of Jessie's and Robert's bus rides?

A



B



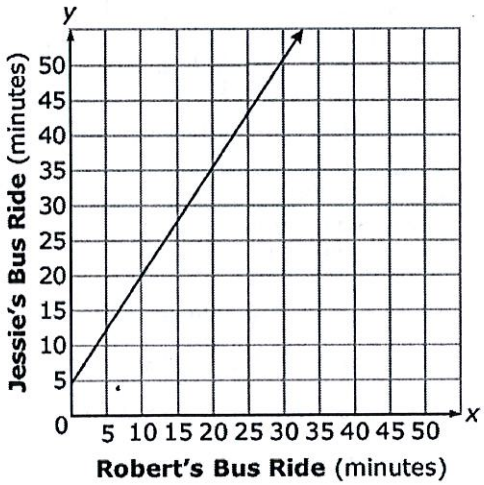
x = robert

y = Jessie

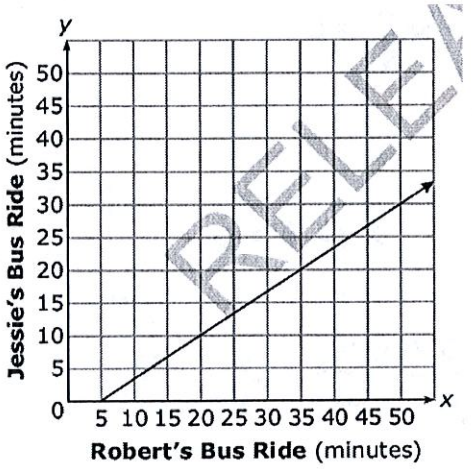
$y = \frac{2}{3}x + 5$

slope, y-int

C



D



6. * Dennis compared the y-intercept of the graph of the function $f(x) = 3x + 5$ to the y-intercept of the graph of the linear function that includes the points in the table below.

Stat → calc → 4

$g(x) = 0.5x + 5.5$

x	$g(x)$
$^{-}7$	2
$^{-}5$	3
$^{-}3$	4
$^{-}1$	5

f(x) y-int: 5

g(x) y-int: 5.5

What is the difference when the y-intercept of $f(x)$ is subtracted from the y-intercept of $g(x)$?

g(x) − f(x)

5.5 − 5 = 0.5

A $^{-}11.0$

B $^{-}9.3$

C 0.5

D 5.5

7. * The boiling point of water, T (measured in degrees), at altitude a (measured in feet) is modeled by the function $T(a) = {}^{-}0.0018a + 212$. In terms of altitude and temperature, which statement describes the meaning of the slope?

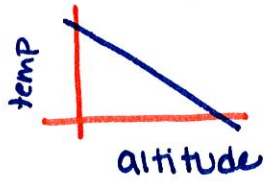
A The boiling point increases by 18 degrees as the altitude increases by 1,000 feet.

B The boiling point increases by 1.8 degrees as the altitude increases by 1,000 feet.

C The boiling point decreases by 18 degrees as the altitude increases by 1,000 feet.

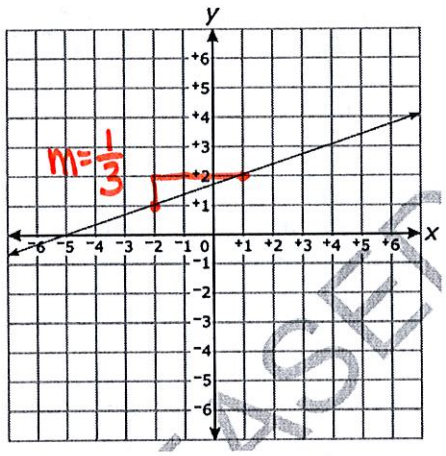
D The boiling point decreases by 1.8 degrees as the altitude increases by 1,000 feet.

slope: −0.0018 ↑ neg.



0.0018 × 1000 = 1.8

8. Mario compared the slope of the function graphed below to the slope of the linear function that has an x-intercept of $\frac{4}{3}$ and a y-intercept of $^{-}2$.



What is the slope of the function with the smaller slope?

A $\frac{1}{5}$

B $\frac{1}{3}$

C 3

D 5

x: (4/3, 0)

y: (0, −2)

Stat → calc → 4

$y = 1.5x - 2$

$y = \frac{3}{2}x - 2$

↑ slope!

9. * The table below shows the distance a car has traveled.

Minutes	25	50	75	100	125
Distance Traveled (in miles)	20	40	60	80	100

$y = 0.8x$ or $y = \frac{4}{5}x$

What is the meaning of the slope of the linear model for the data?

A The car travels 5 miles every minute.

B The car travels 4 miles every minute.

C The car travels 4 miles every 5 minutes.

D The car travels 5 miles every 4 minutes.

slope: $\frac{y}{x} = \frac{\text{Distance}}{\text{minutes}} = \frac{4 \text{ miles}}{5 \text{ min}}$

10. Cell phone Company *Y* charges a \$10 start-up fee plus \$0.10 per minute, *x*. Cell phone Company *Z* charges \$0.20 per minute, *x*, with no start-up fee. Which function represents the difference in cost between Company *Y* and Company *Z*?

A $f(x) = -0.10x - 10$

B $f(x) = -0.10x + 10$

C $f(x) = 10x - 0.10$

D $f(x) = 10x + 0.10$

X = # of minutes

Company Y: $0.10x + 10$

Company Z: $0.20x$

$y - z = 0.10x + 10 - 0.20x$

$= -0.10x + 10$

11. What is the value of w in the equation $\frac{3}{4}w + 8 = \frac{1}{3}w - 7$?

[1] 2.4 [2] -0.2 [3] -13.846 [4] -36

$\frac{3}{4}w + 8 = \frac{1}{3}w - 7$

$12\left[\frac{3}{4}w = \frac{1}{3}w - 15\right]$

$9w = 4w - 180$

$5w = -180$

$w = -36$

12. What is the slope of the line containing the points (-9,2) and (3,14)?

[1] 1 [2] -1 [3] $-\frac{8}{3}$ [4] -2

$\frac{14-2}{3+9}$

$= \frac{12}{12} = 1$

13. The table below shows the shoe size and age of 7 boys.

$y = 1.13x + 4.1$

Name	Shoe Size (x)	Age (y)
Tyrone	6	9 ✓
Marcel	6	11
Patrick	7	15 ✓
Bobby	8	11 ✓
Dylan	9	15
Mike	10	16
Jonathan	12	17

Approximately what percent of the boys' ages is more than 1 year different from the age predicted by the line of best fit for the data?

A 14%

B 29%

C 43%

D 57%

$y = 1.13(6) + 4.1 = 10.88$

$y = 1.13(7) + 4.1 = 12.01$

$y = 1.13(8) + 4.1 = 13.14$

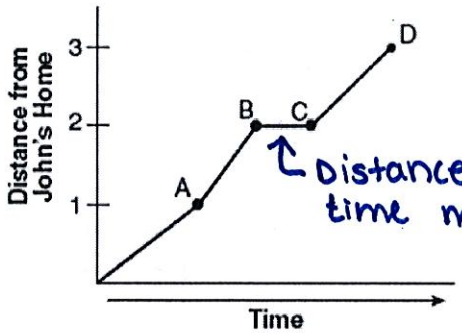
$y = 1.13(9) + 4.1 = 14.27$

$y = 1.13(10) + 4.1 = 15.4$

$y = 1.13(12) + 4.1 = 17.66$

$\frac{\#\text{ Different}}{\text{total}} = \frac{3}{7} = 43\%$

14. John left his home and walked 3 blocks to his school, as shown in the accompanying graph. What is one possible interpretation of the section of the graph from point *B* to point *C*?



↑ Distance does not change, but time moves forward

[1] John arrived at school and stayed throughout the day.

[2] John waited before crossing a busy street.

[3] John returned home to get his mathematics homework.

[4] John reached the top of a hill and began walking on level ground.