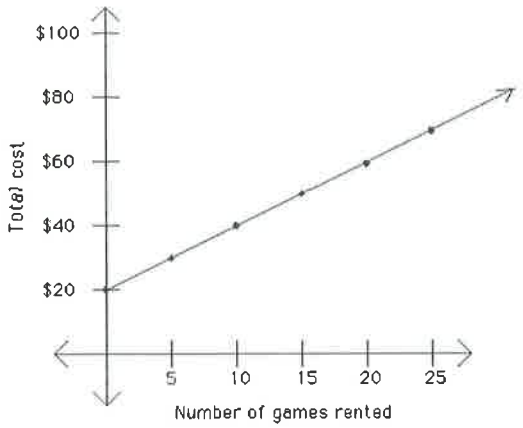
Review
Unit 3: Linear Functions

Name key
Date _____ Period _____

Remember to study ALL of unit 3! Review your notes, the linear equations book, old homeworks, unit 3 mid-unit test, and quizzes. This review should not be your only means of studying!

1. The graph below shows the relationship between the total cost of renting games and the number of games rented. What does the slope represent?

PER!!

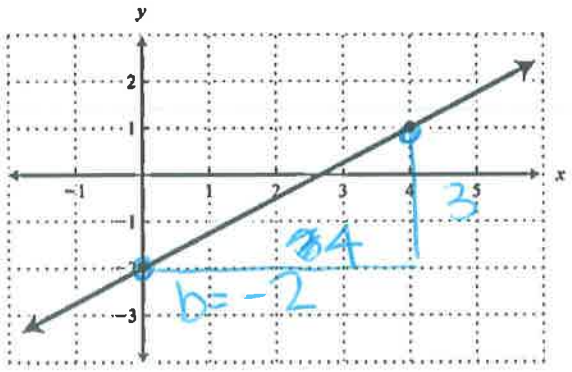


$m = \frac{\Delta y}{\Delta x} = \frac{\text{cost}}{\text{game}}$

cost per game!

A. The number of games rented it takes to have a total cost of $80
B. The cost per game rented
C. The initial cost of renting a game -- y-int
D. The number of games rented per dollar spent

2. A graph is shown below.



$m = \frac{\text{RISE}}{\text{RUN}} = \frac{3}{4}$

Which of the equations are represented by the graph?

I. $y = \frac{4}{3}x - 2$ wrong slope!

II. $y - 1 = \frac{3}{4}(x - 4)$ $m = \frac{3}{4}$ point: (4, 1) ✓

III. $3x - 4y = 8$ plug in (0, -2) $3(0) - 4(-2) = 8$ ✓

IV. $y = -2x + 1$ wrong slope

(not even in answer choices)

A. II and III
B. II only
C. I and II
D. I and III

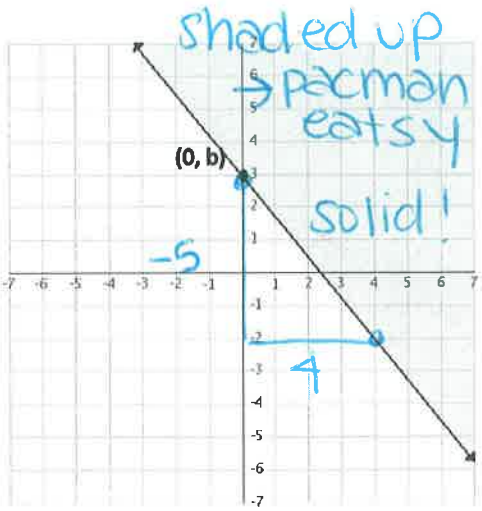
3. The value of y varies directly with x. Which function represents the relationship between x and y if $y = \frac{15}{4}$ when x = 45?

2 #s → equation $y = kx$

$k = \frac{y}{x} = \frac{\frac{15}{4}}{45} = .083 = \frac{1}{12}$

A. $y = 225x$
B. $y = 12x$
C. $y = \frac{1}{12}x$
D. $y = \frac{60}{3}x$

4. Which inequality can be represented by the graph below?



$m = \frac{-5}{4}$

$b = b$

$y \geq -\frac{5}{4}x + b$

A. $y \geq -\frac{5}{4}x + b$ ✓
B. $y - \frac{5}{4}x \leq b$
C. $y \geq -\frac{5}{4}x - b$
D. $y - b \leq -\frac{4}{5}x$ wrong sign

5. Adam purchased Snickers chocolates for \$5 a bag and Skittles for \$3 a bag. The inequality $5x + 3y < 30$ can be used to determine the number of bags of Snickers, x, and the number of Skittles, y, Adam purchased for less than \$30, not including tax. Which of the following ordered pairs best represents a reasonable combination of bags of Snickers and Skittles that Adam could have purchased? Plug in points!!

$5x + 3y < 30$

a) $5(3) + 3(5) < 30$?
$30 \not< 30$

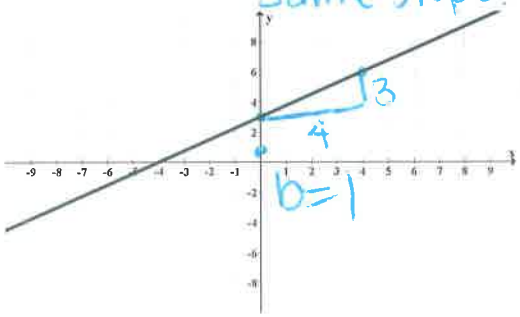
b) $5(2) + 3(8) < 30$?
$34 \not< 30$ ✗

c) $5(2) + 3(5) < 30$?
$25 < 30$ ✓

d) $5(4) + 3(6) < 30$
$38 < 30$ ✗

a. (3,5)
b. (2,8)
c. (2,5)
d. (4,6) ← Skittles (y)
↑ Snickers (x)

6. Nick drew the graph below. Joe drew a line that is parallel to Nick's line but is shifted 2 units down along the y-axis.



$m = \frac{3}{4}$

Which function would best represent Joe's line?

F $f(x) = \frac{4}{3}x + 1$

G $f(x) = \frac{3}{4}x - 1$

H $f(x) = \frac{3}{4}x + 1$

J $f(x) = -\frac{4}{3}x + 1$

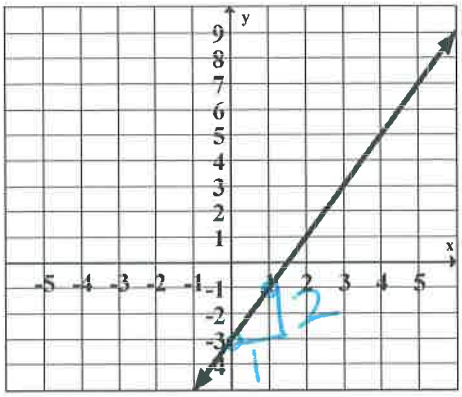
7. In the xy-plane, the equation of line g is $2x - y = 3$. Which of the following is an equation of a line perpendicular to line g?

A. $y = 2x + 4$

B. $y = -\frac{1}{2}x + 4$

C. $y = \frac{1}{2}x + 4$

D. $y = -2x + 4$



$m = \frac{2}{1}$

flip

$-\frac{1}{2}$

♫ Numbers are flipped & the signs are opposite ♫

8. A plumber charges $50 down payment plus $21.50 for each hour that he works. Which sentence could be used to find C, the cost in dollars for a house visit and h, hours of work?

A. $C = (50 + 21.50)h$

B. $C = 50h + 21.50$

C. $C = 50 + 21.50h$

D. $C = (50 - 21.50)h$

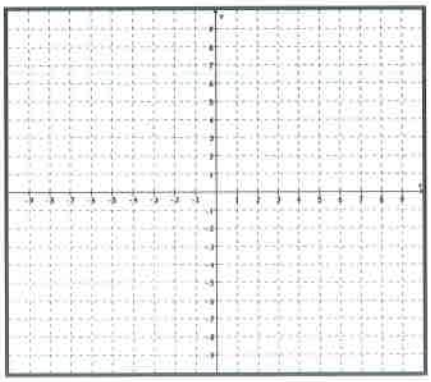
per

$C = 50 + 21.50h$

y-int: down payment

m: cost per hour

9. What is the coordinate point of the x-intercept of the equation $2x - 6y = 4$?



x-intercept:

cover up y!

$2x - 6(0) = 4$

$\frac{2x}{2} = \frac{4}{2}$

$x = 2$

A $(-6, 0)$

B $(2, 0)$

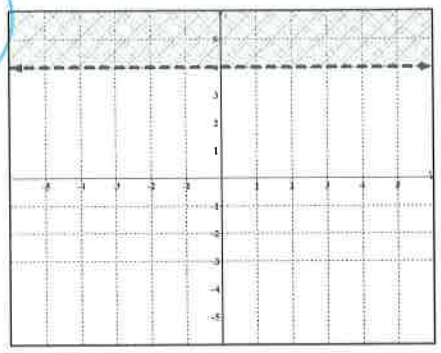
C $(0, 4)$

D $(4, 0)$

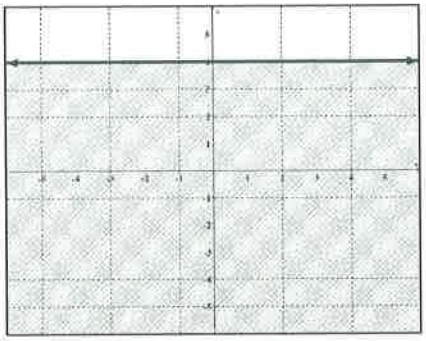
10. Which is the best representation for the linear inequality $y > 4$?

no line = dotted

F



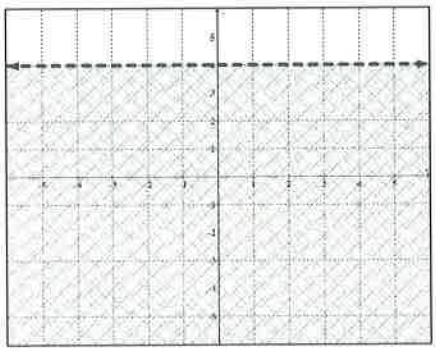
G



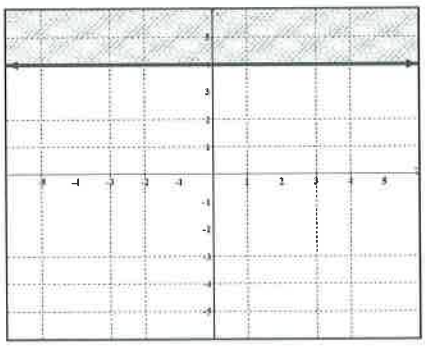
HOY VUX

- horizontal
- pacman
- eats y →
- shade up!

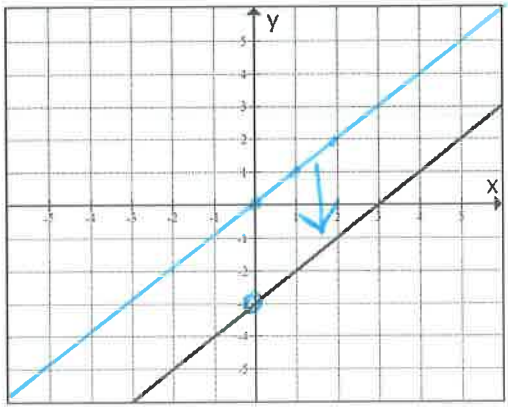
H



J



11. The function $g(x)$ is graphed below. Determine the effect on the graph of the parent $f(x) = x$ to get $g(x)$.



y = x (parent function)

m = 1

down 3

(subtract!!)

A The function $g(x) = f(x) + 3$

B The function $g(x) = f(x)$

C The function $g(x) = f(x) - 3$

D The function $g(x) = f(x) + 1$

12. The table shows the amount of money Courtney spends on different quantities of candles.

Number of Candles, x	Cost, y
5	$37.50
15	$112.50
25	$187.50
40	$300.00

+10, +10, +15

+75, +75, +112.5

slope

What is the cost of each candle?

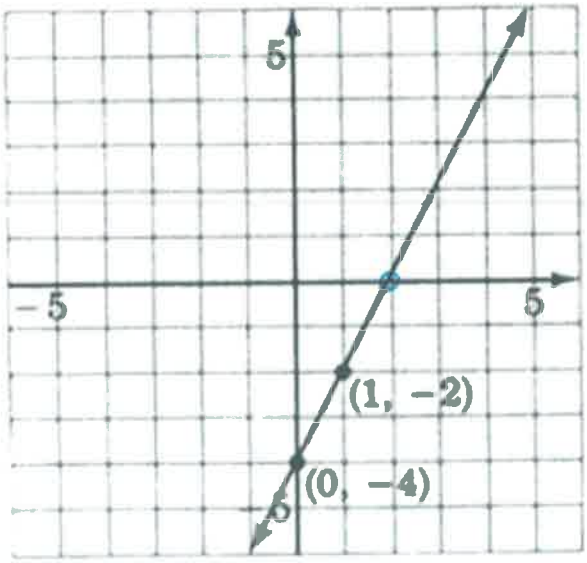
$m = \frac{\Delta y}{\Delta x} = \frac{75}{10} = 7.50$

$\frac{\Delta y}{\Delta x} = \frac{112.5}{15} = 7.50$

7.50

13. What is the zero of the linear function graphed below?

x-intercept



About 2

14. What is the equation in standard form of the line that passes through the point (3,3) and has a slope of -0.8?

x y

m = -.8

A. 4x + 5y = -27

B. 4x + 5y = 27

C. 4x – 5y = 80

D. 4x – 5y = 80

A/B $4(3)+5(3)=27$

C/D $4(3)-5(3)=-3$

15. The graph of the line *p* represents $y = 3x - 1$. If 10 is added to the line *p* to create line *r*, which statement about the graphs of the two lines is true?

F Line *r* intersects line *p*.

G Line *r* is parallel to line *p*.

H Line *r* is 10 units above line *p*.

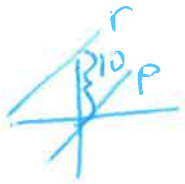
J Line *r* is 10 units below line *p*.

$r = p + 10$

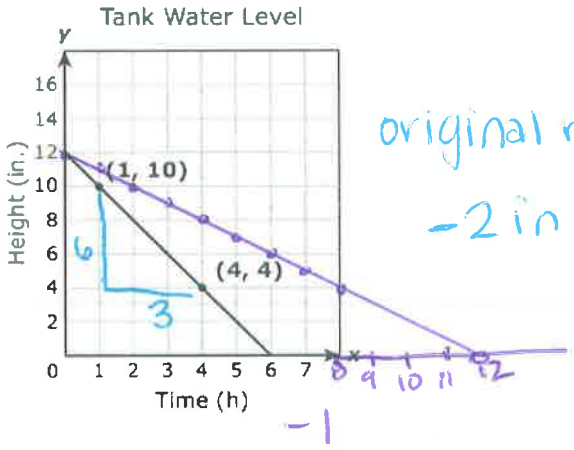
$r = (3x - 1) + 10$

$r = 3x + 9$

same slope = parallel!



16. The graph below shows the water level in a tank being drained at a constant rate.



original rate: $\frac{-6}{3} = \frac{-2}{1}$

-2 in per hour

-1

If the rate at which the tank is drained is changed to 1 inch per hour and the initial water level stays the same, how would the time it takes to empty the tank be affected?

A It would take 4 fewer hours.

B It would take 1.5 more hours.

C It would take 6 more hours.

D It would take 2 fewer hours.

17. Find the slope of the line that passes through the points (6, 2) and (4, -4). $m = \frac{y_2 - y_1}{x_2 - x_1}$ (x_1, y_1; x_2, y_2) $= \frac{-4-2}{4-6} = \frac{-6}{-2}$

+3/1

What is the slope of a line parallel to the above slope? 3

SAME

What is the slope of a line perpendicular to the above slope? $-\frac{1}{3}$

flippin' opposites

OR

x	y
6	2
4	-4

$-2 < \quad > -6$

$m = \frac{\Delta y}{\Delta x} = \frac{-6}{-2} = 3$