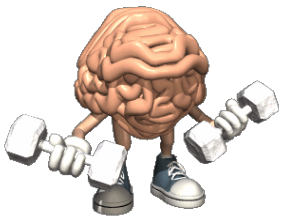
Warm Up



1a)What is the slope of a line that passes through the points(14,-18) and (8, -20) ?

x_1 y_1 x_2 y_2

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{(-20) \overset{+}{-} (-18)}{(8) - (14)}$$

$$= \frac{-2}{-6}$$

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

b)What is the slope of a line perpendicular to a line that passes through the points(5,3) and (-12, 6) ?

x_1 y_1 x_2 y_2

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{(6) - (3)}{(-12) - (5)}$$

$$= \frac{3}{-17}$$

$$= -\frac{3}{17}$$

$$m_{\perp} = +\frac{17}{3}$$

perpendicular

$$m_{//} = -\frac{3}{17}$$

parallel

Homework Solutions

pg 349-351 #3,5,8(a,b), 10, 23

M. O'Keefe

10,11,13,17,19,22

Quiz OUTLINE

Quiz Wednesday (Similar to all warm ups) :

Must Know

Slope of Horizontal is zero

Vertical lines have slope undefind,

Perpendicular Slopes have opposite reciprocals → opposite sign and flip fraction

Parallel lines have equal slopes

Know which number represents the y-intercept and slope in and equation given in the form y=mx+b

$y = 5x - 7$ $m = 5$ (slope) $b = -7$ (yintr)

Calculate slope when given two points, Today's warm-up

Given a slope know the slope of a line that is perpendicular or parallel to it.

Know that intercepts are points on a line so it can be used to find slope (#10 from HW)

Given a word problem, write the equation in the form y = mx+b

Ex) A dinner party cost \$15 per person and to rent hall is an additional \$50. Write an equation

$C = 15p + 50$

3. The slopes of lines are given below. For each line, what is the slope of a parallel line? parallel

a) $\frac{4}{5}$

$m_{//} = \frac{4}{5}$

b) $-\frac{4}{3}$

$m_{//} = \frac{-4}{3}$

c) 3

$m_{//} = 3$

d) 0

$m_{//} = 0$

4a) $m = \frac{7}{6}$

$m_{\perp} = -\frac{6}{7}$

b) $m = -\frac{5}{8}$

$m_{\perp} = +\frac{8}{5}$

c) $m = \frac{9}{1}$

$m_{\perp} = -\frac{1}{9}$

d) $m = -\frac{5}{1}$

$m_{\perp} = +\frac{1}{5}$

5. The slopes of two lines are given. Are the two lines parallel, perpendicular, or neither?

a) 4, 4

same
parallel

b) $\frac{1}{6}$, 6

reciprocals
but
not
opposite
so neither

parallel

perpendicular

c) $\frac{7}{8}$, $-\frac{7}{8}$

opposite in sign
but not reciprocals
neither

opp
recip

d) $\frac{1}{10}$, -10

Perpendicular

8 a) i) $A(\overset{x_1}{-5}, \overset{y_1}{-2})$ $B(\overset{x_2}{1}, \overset{y_2}{5})$

$C(+1, -4)$ $D(4, 1)$

$$m_{AB} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{5 - -2}{1 - -5}$$

$$= \frac{5+2}{1+5}$$

$$= \frac{7}{6}$$

$$= \frac{-7}{-6} = +\frac{7}{6}$$

neither

$$m_{CD} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{1 - -4}{4 - -1}$$

$$= \frac{1 + +4}{4 + +1}$$

$$= \frac{5}{5}$$

$$= +1$$

8b) $E(\overset{x_1}{-3}, \overset{y_1}{4})$ $F(\overset{x_2}{3}, \overset{y_2}{2})$

$G(2, 5)$ $H(0, -1)$

$$m_{EF} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{2 - 4}{3 - -3}$$

add opp

$$= \frac{2 - 4}{3 + +3}$$

$$= \frac{-2}{6}$$

Reduce

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

$$m_{GH} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{-1 - 5}{0 - 2}$$

$$= \frac{-6}{-2}$$

$$= +3$$

opposite reciprocals so perpendicular

$EF \perp GH$

10. How are the lines in each pair related? Justify your answer.

a) DE has an x-intercept of 4 and a y-intercept of -6.
FG has an x-intercept of -6 $(-6,0)$ and a y-intercept of 4. $(0,4)$

b) HJ has an x-intercept of -2 and a y-intercept of 3. H(-2,0) J(0,3)
KM has an x-intercept of -9 and a y-intercept of 6. K(-9,0) M(0,6)

a) x-inter (4,0) (x, y)
y int (0,-6) (x, y)

$m_{AB} = \frac{-6-0}{0-4}$
$= \frac{-6}{-4}$
$= \frac{3}{2}$

F (-6,0) G(0,4)
$m = \frac{4-0}{0--6}$
$= \frac{4}{6}$
$= \frac{2}{3}$

Not same
Flipped

Not parallel

Signs are not different

Not ⊥

Neither

M. O'Keefe

23. Given A(3, 5), B(7, 10), C(0, 2), and D(1, a), determine the value of a for ~~which:~~

Same slope

a) Line AB is parallel to line CD.

A(3,5) B(7,10)

$m = \frac{y_2 - y_1}{x_2 - x_1}$

$= \frac{10-5}{7-3}$

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

(0,2) (1,a)

$m = \frac{y_2 - y_1}{x_2 - x_1}$

$\frac{5}{4} = \frac{a-2}{1-0}$

$\frac{5}{4} = \frac{a-2}{1}$

$5 = 4(a-2)$

$5 = 4(a-2)$

$\frac{5}{4} = a - 2$

$\frac{5}{4} + 2 = a$

$\frac{5}{4} + \frac{8}{4} = a$

$\frac{13}{4} = a$

$5 = 4a - 8$ (+8 +8)

$13 = 4a$

$a = \frac{13}{4}$

$(0,2)$ $(1, \frac{13}{4})$

Slope Intercept Form

$$y = mx + b$$

$$y = mx + b$$

Slope (m)

y-intercept (b)

also have a point

$(0, y)$

1) $y = mx + b$

Given $y = -\frac{1}{2}x + 5$

What is the slope and the y -intercept? (Write the y-intercept as an ordered pair) $m = \frac{-1}{2}$ $b = 5$

$(0, 5)$

2)

Given $y = 2x - 7$

What is the slope and the y -intercept? (Write the y-intercept as an ordered pair) $m = 2$ $b = -7$

$(0, -7)$

3) Write the equation of a line given m= 2 and a point of the line is (0, -3)

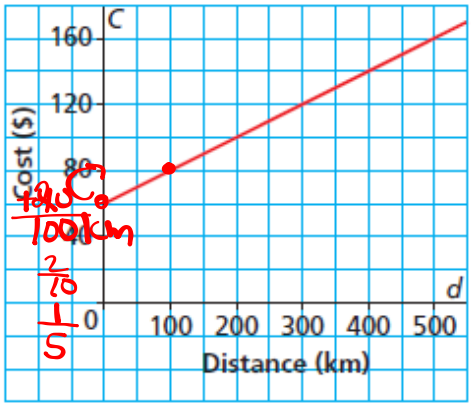
this a y-intercept $b = -3$

$y = mx + b$

$y = 2x - 3$

In Chapter 5, Lesson 5.6, we described a linear function in different ways. The linear function below represents the cost of a car rental.

Car Rental Costs



An equation of the function is:
$C = 0.20d + 60$

The number 0.20 is ?
→ Rate of change
→ Slope

The number 60 is ?
→ y intercept
→ cost at 0 km

Slope should be written as a fraction. Looking at the graph what is the rate of change as a fraction? (Reduce fractions)

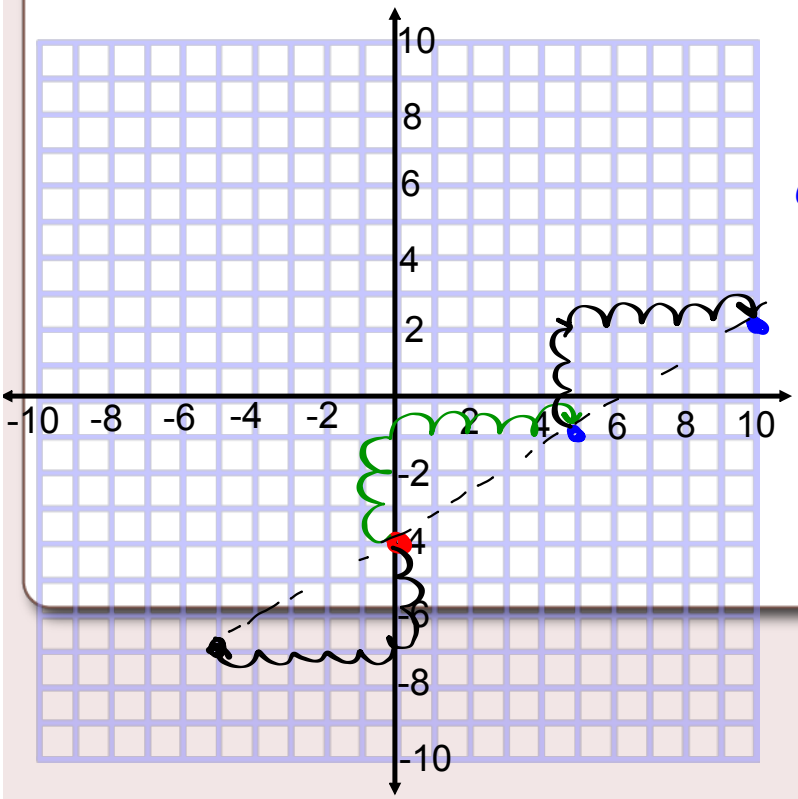
Use this to rewrite the equation of the line.

Example 1 Writing an Equation of a Linear Function Given Its Slope and y-Intercept

he graph of a linear function has slope $\frac{3}{5}$ and y-intercept -4.

/rite an equation for this function.

point $(0,-4)$



Graph the following

To graph a line you need :

i) One point $(0,-4)$

ii) Slope $m = \frac{3}{5}$ $\frac{\text{rise}}{\text{run}}$

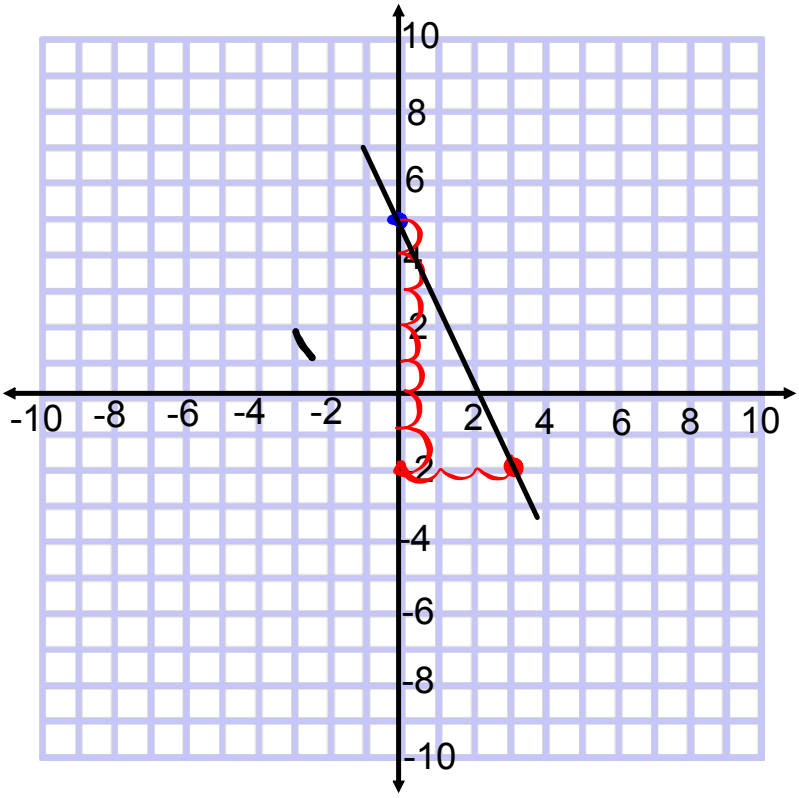
$\frac{+3 \text{ rise}}{+5 \text{ run}}$ $\frac{-3}{-5}$

1. The graph of a linear function has slope $-\frac{7}{3}$ and y-intercept 5. Write an equation for this function.

point (0,5)

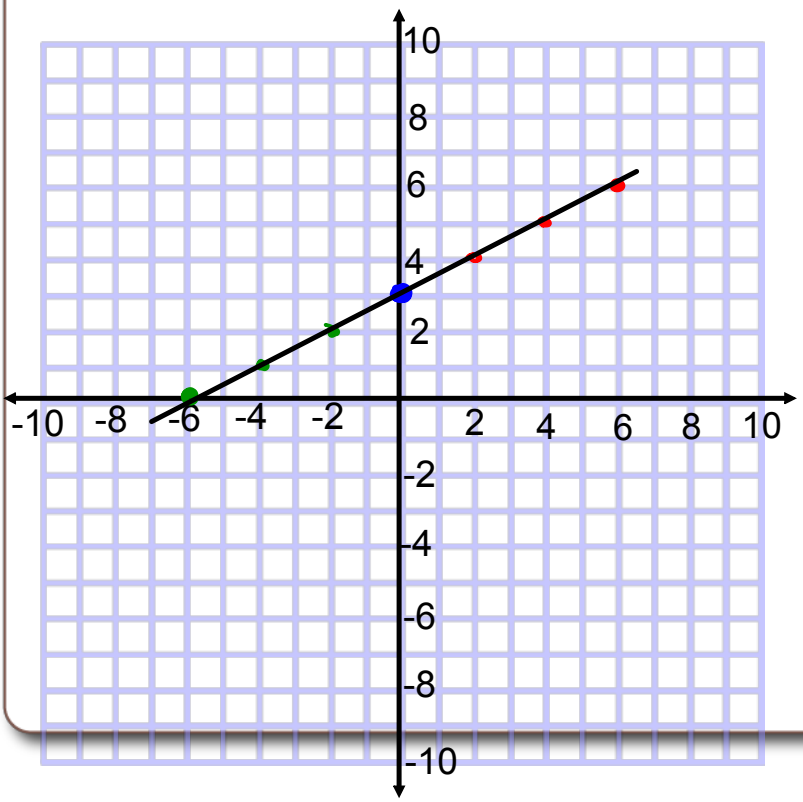
$m = -\frac{7}{3}$

$\frac{-7}{+3}$ rise run $\frac{+7}{-3}$



Example 2 Graphing a Linear Function Given Its Equation in Slope-Intercept Form

Graph the linear function with equation: $y = \frac{1}{2}x + 3$



$b = +3$

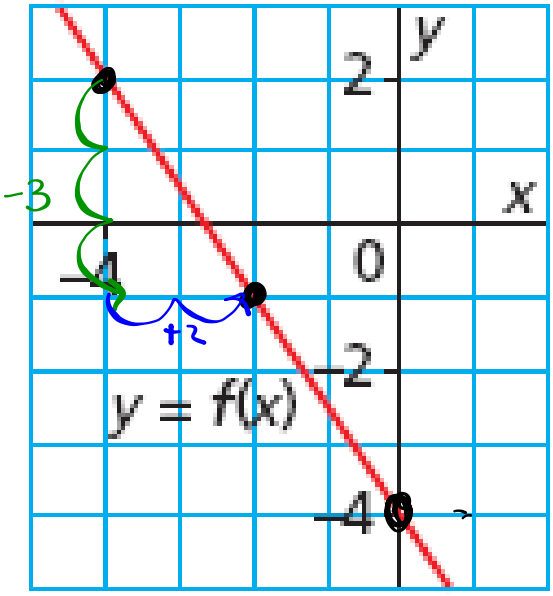
$(0,3)$

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

$\frac{+1}{+2}$ $\frac{\text{rise}}{\text{run}}$ $\frac{-1}{-2}$

Example 3 Writing the Equation of a Linear Function Given Its Graph

Write an equation to describe this function. Verify the equation.



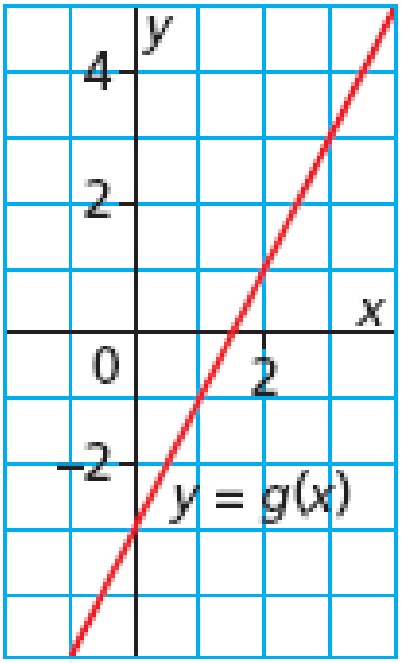
$m = \frac{\text{rise}}{\text{run}} = \frac{-3}{+2} = -\frac{3}{2}$

$b = -4$

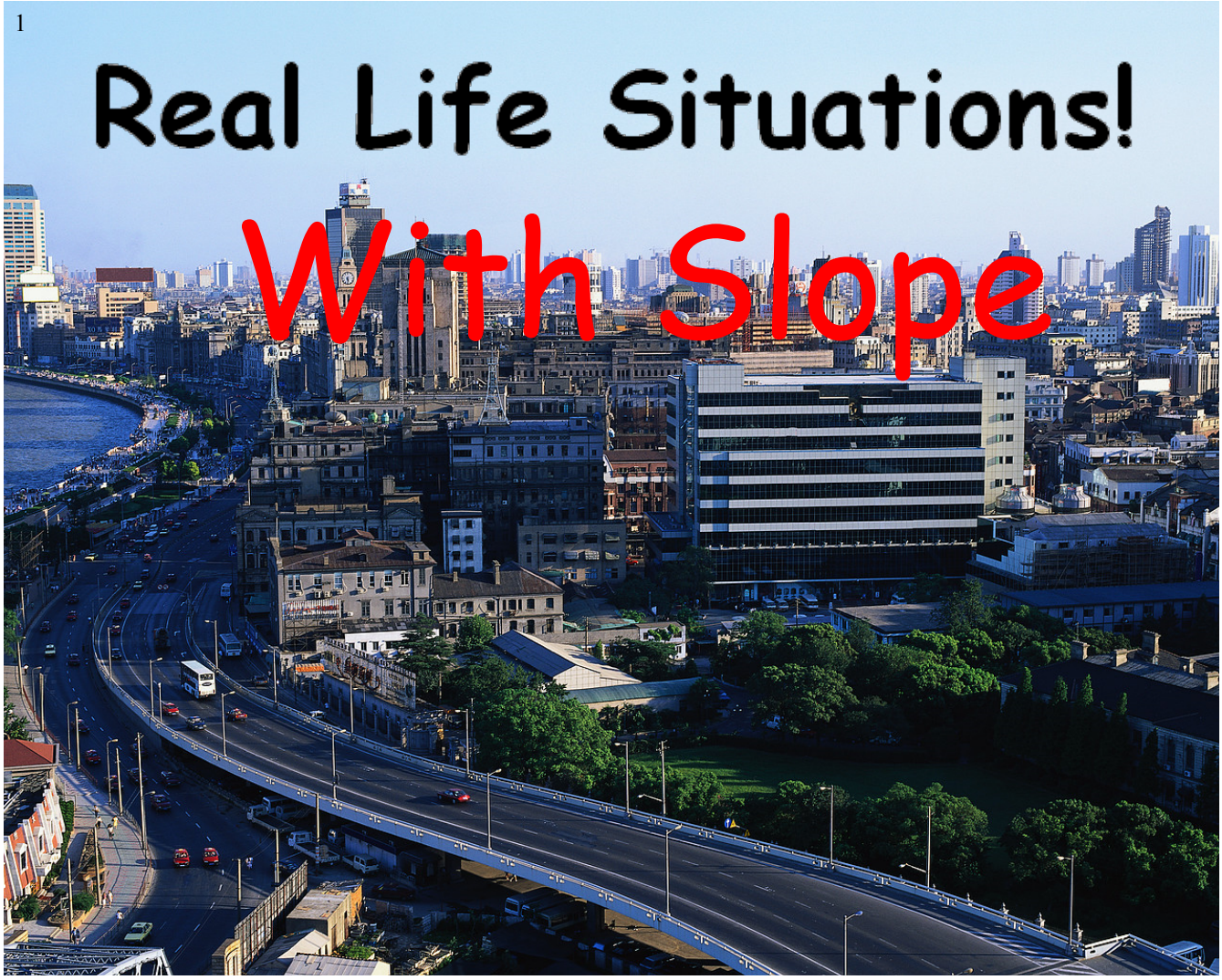
$y = mx + b$

$\boxed{y = -\frac{3}{2}x - 4}$

3. Write an equation to describe this function. Verify the equation.



1



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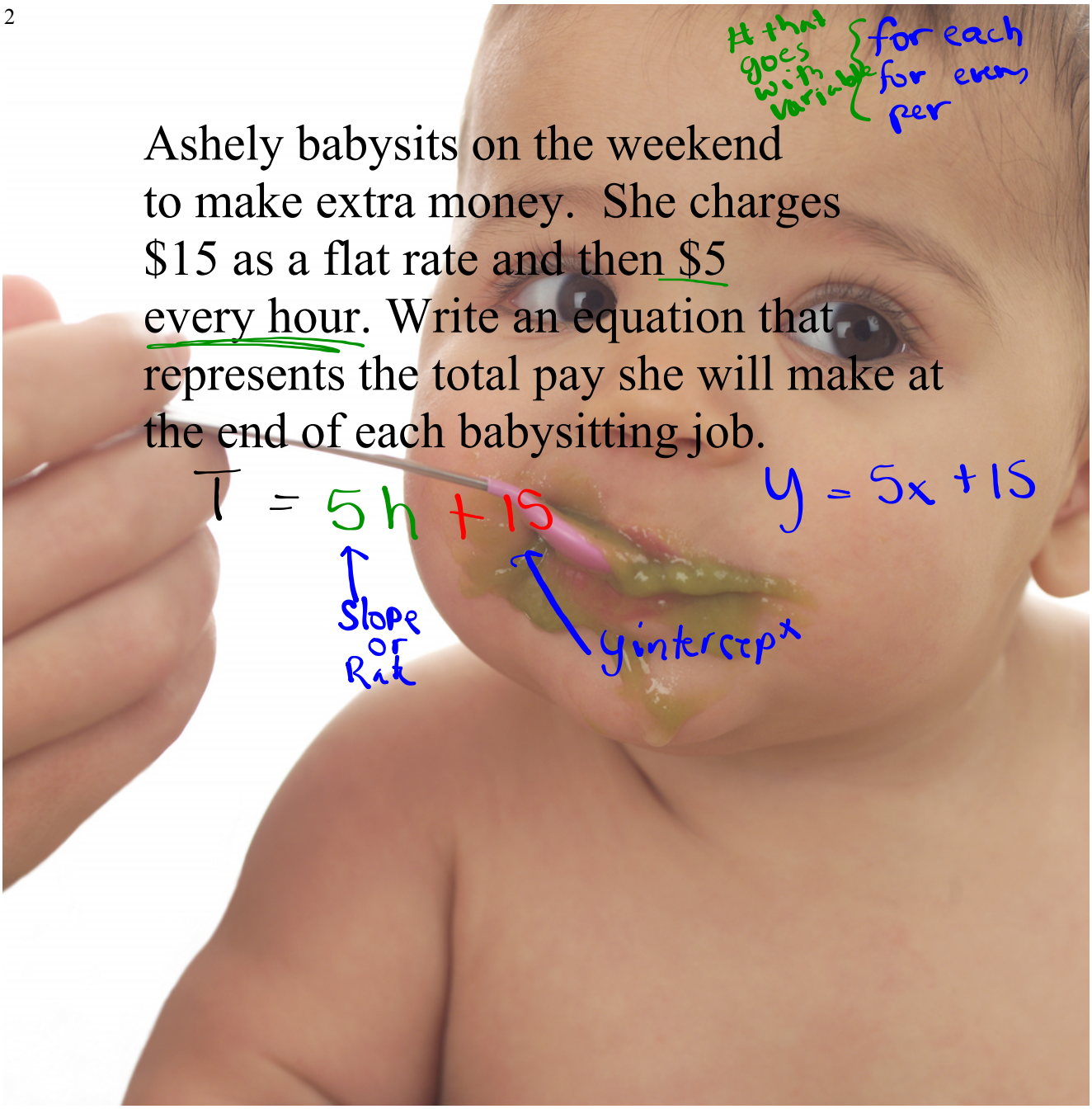

that goes with variable { for each / for every / per

Ashely babysits on the weekend to make extra money. She charges $15 as a flat rate and then $5 every hour. Write an equation that represents the total pay she will make at the end of each babysitting job.

$T = 5h + 15$

$y = 5x + 15$

Slope or Rate

y intercept

3

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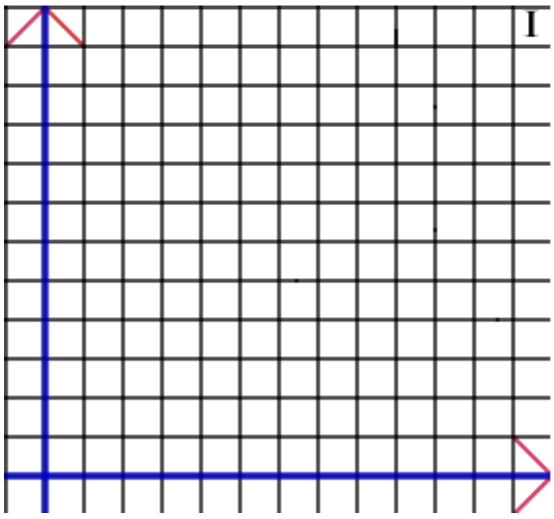
Graph

y



x

b =
m =
x =
y =

Equation

1. How much would it cost to have Ashley babysit for 3 hours?

2. How many hours could you ahve Ashley babysit for if you had $45?

$$y = mx + b$$

Slope (m) = Cost per hour, Cost per Km, Cost per picture, etc.....

y-intercept (b)= Initial cost, base rate, initial fee, flat rate, sitting fee, starting cost etc.....

x = Number of kilometers, Number of hours, Number of pictures, etc....

y = Total Cost $$$$, Total Earned $$$

Homework

Page 362-364:

Questions: 4(a,b,c),5(a,c,e), 6(a,[illegible]), 7(a,[illegible],c,[illegible]),
8,[illegible]

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