Writing Point-Slope Equations
Homework-Academic

Name _____**KEY**_____

Date _____ Period _____

I. Complete the following:

1. Suppose you own a car that is presently 40 months old. According to statistics, it loses $240 in value each month. A dealer's "blue book" shows its current value is $6400.

   ~~rate~~ (circled)

   (months, $)

   a. Identify the point from this situation.

   $(40, 6400)$

   b. Identify the slope. What does it represent in this situation?

   $m = -240$ It represents that the car loses $240 a month in value

   c. Write the equation of the line in point-slope form. (convert to slope-intercept form)

   $y - 6400 = -240(x - 40)$
   $y - 6400 = -240x + 9600$
   $ +6400 +6400$
   $y = -240x + 16000$

   d. Identify the y-intercept. What does it represent in this situation?

   $(0, 16,000)$ Initial value of car was $16,000

   e. How much was the car worth when it was 20 months old?

   $y = -240x + 16000$
   $y = -240(20) + 16000$
   $y = 11200$

   $\boxed{\$11,200}$

   f. When will the car be worth $5000?

   $y = -240x + 16000$
   $5000 = -240x + 16000$
   $-16000 -16000$
   $-11000 = -240x$

   $\dfrac{-11000}{-240} = \dfrac{-240x}{-240}$
   $45.83 = x$

   $\boxed{\approx 46 \text{ months}}$

2. Marty received a check for his birthday. He spends $8 per day. After 10 days, he has $120 left.

   $m = -8$ point $(10, 120)$ rate   EQ: $y - 120 = -8(x - 10)$
   $y - 120 = -8x + 80$
   $ +120 +120$
   $y = -8x + 200$

   a. How much will he have left 15 days after his birthday?

   $y = -8x + 200$
   $y = -8(15) + 200$ $\boxed{\$80}$
   $y = 80$ $x = 15$

   b. When will he run out of money? $y = 0$
   $y = -8x + 200$
   $0 = -8x + 200$
   $-200 = -8x$
   $\dfrac{-200}{-8} = \dfrac{-8x}{-8}$
   $x = 25$ $\boxed{25 \text{ days}}$

   c. What was the amount of the check?

   $\boxed{\$200}$ → the y-intercept
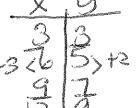
II. Complete the following.

3. Find three more points with integer coordinates that lie on the line through (6, 5) with slope $\frac{2}{3}$.

$\frac{\Delta y}{\Delta x}$

make table

x	y
$\overset{+3}{\overset{\frown}{6}}$	$\overset{5}{\underset{+2}{\frown}}$
3	3
9	7
12	9

use slope

(3, 3)
(9, 7)
(12, 9)

4. What is the equation of the line with a slope of −2 that goes through the origin? (0, 0)

$y = mx + b \qquad m: -2$

means $b = 0$

$$y = -2x$$

III. Write the point–slope form of an equation of the line that passes through the given point and has the given slope. **Convert to slope–intercept form and identify the y–intercept.**

5. (3, 8); slope = 2 y-intercept: (0, 2)

$y - 8 = 2(x - 3)$

$\underset{+8}{y - 8} = 2x - 6 \underset{+8}{}$

$$y = 2x + 2$$

6. (−3, 6); slope = 0 y-intercept: (0, 6)

horizontal

$y - 6 = 6(x + 3)$

$$y = 6$$

7. (9, 1); slope = $\frac{2}{3}$ y-intercept: (0, −5)

$y - 1 = \frac{2}{3}(x - 9)$

$\underset{+1}{y - 1} = \frac{2}{3}x - 6 \underset{+1}{}$

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

8. (−2, −4); slope = −5 y-intercept: (0, −14)

$y + 4 = -5(x + 2)$

$\underset{-4}{y + 4} = -5x - 10 \underset{-4}{}$

$$y = -5x - 14$$