Writing Point-Slope Equations

Class Activity/Notes

Given: m = slope, point (x_1, y_1)

Name _____

Date _____ Period _____

Point-slope form: $y - y_1 = m(x - x_1)$

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. → (0, b)

$y = mx + b$

x_1, y_1 m

1. (1, 6); slope = 3

$y - 6 = 3(x - 1)$

$y - 6 = 3x - 3$

$+6 \quad +6$

$y = 3x + 3$ (0, 3)

2. (–5, 9); slope = -1

$y - 9 = -1(x + 5)$

$y - 9 = -x - 5$

$+9 \quad +9$

$y = -x + 4$ (0, 4)

3. (–6, –2); slope = $\frac{-1}{2}$

$y + 2 = -\frac{1}{2}(x + 6)$

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

$-2 \quad -2$

$y = -\frac{1}{2}x - 5$ (0, –5)

4. (3, –5); slope = 0 horizontal

$y + 5 = 0(x - 3)$

$y + 5 = 0$

$-5 \quad -5$

$y = -5$

$y = -5$

x_1, y_1 m

5. (4, 2); m = 2

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

$y - 2 = 2x - 8$

$+2 \quad +2$

$y = 2x - 6$ (0, –6)

6. (4, –2); m = $\frac{1}{4}$

$y + 2 = \frac{1}{4}(x - 4)$

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

$-2 \quad -2$

$y = \frac{1}{4}x - 3$ (0, –3)

7. A repairman charges $25 per hour plus an initial service charge. The bill for 3 hours is $105.

DV IV + b

rate

(hours, $)

a. Identify the point in this situation.

(3, 105)

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

m = 25 It represents the 25 dollars per hour charge

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

$y - 105 = 25(x - 3)$

$y - 105 = 25x - 75$

$+105 \quad +105$

$y = 25x + 30$

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

(0, 30) It represents the $30 service charge

e. How much would the bill be if the repair took 7 hours?

F $y = 25x + 30$

$y = 25(7) + 30$

$y = 205$

$205

S f. Suppose you had $140 to spend on the service call. How long could the repairman stay?

S $y = 25x + 30$

$140 = 25x + 30$

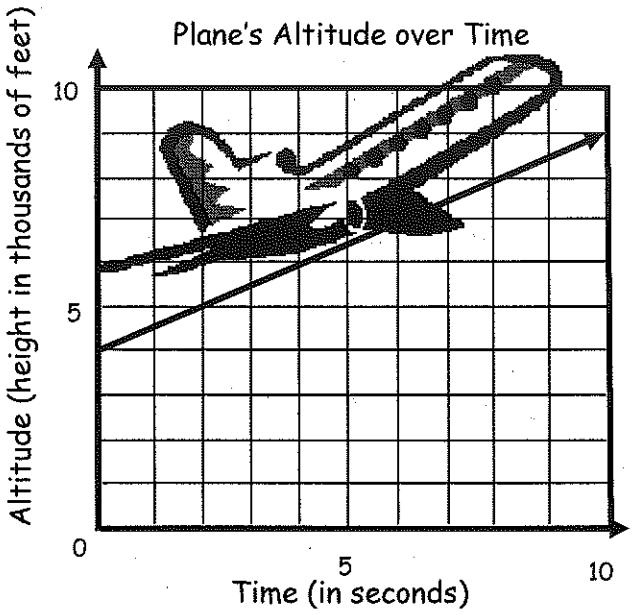
$-30 \quad -30$

$110 = 25x$

$\frac{110}{25} = \frac{25x}{25}$

$x = 4.4$ hours

8. After flying at a constant altitude, a pilot decides to zoom upward. The graph shows the change in altitude each second.



a. What ordered pair shows the altitude at 2 seconds?

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

c. Write the equation in point–slope form and convert to slope–intercept form.

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

e. After how many seconds will the altitude be 13,000 feet?