

The **point-slope form** of a linear equation is:

$$y = m(x - x_1) + y_1$$

where **m** is your slope, and  $(x_1, y_1)$  is a point on the line.

Let's do some examples together:

1a. Write an equation of a line in **point-slope form** that has a slope of -2 and passes through the point (1,-4).

$$y = -2(x - 1) + -4$$

b. Now, convert the equation to slope-intercept form.

$$y = -2x + 2 - 4$$

$$y = -2x - 2$$

c. Now, convert the equation to standard form.

$$+2x \quad +2x$$

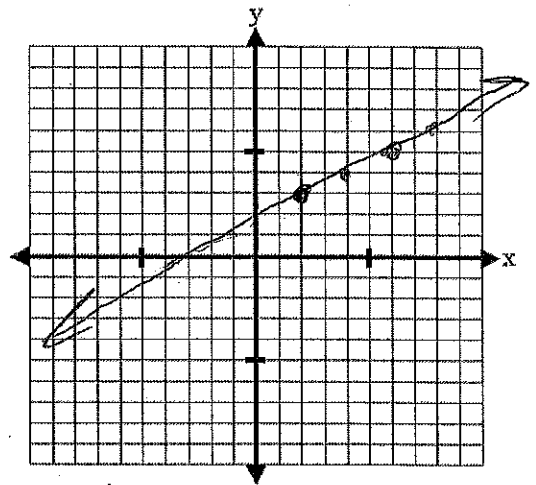
$$2x + y = -2$$

2. Graph the equation of  $y - 3 = \frac{1}{2}(x - 2)$ .

$$+3 \quad +3$$

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

Slope  $\nearrow$   $\nwarrow$  (2,3) = point

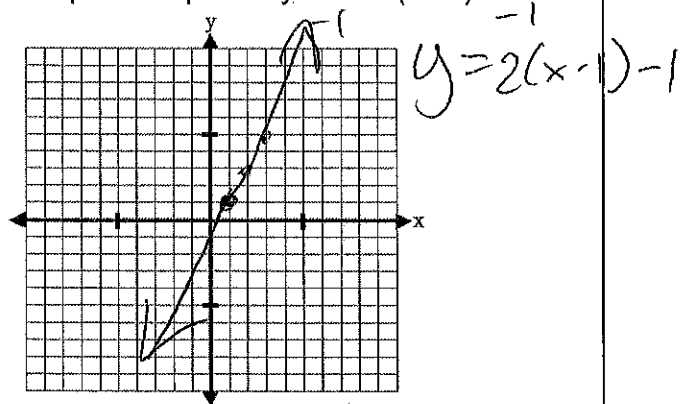


3. Write an equation of a line in point-slope form with a slope of 4 and that passes through the point (-3, 5).

$$y = 4(x - -3) + 5$$

$$y = 4(x + 3) + 5$$

4. Graph the equation  $y + 1 = 2(x - 1)$ .



Find the slope of the line that passes through the given points. (Hint: What's the formula to find slope?)

1. (6, 10), (4, 2)

$$\frac{10-2}{6-4} = \frac{8}{2}$$

2. (-2, 5), (7, 12)

$$\frac{5-12}{-2-7} = \frac{-7}{-9} = \frac{7}{9}$$

3. (-3, -3), (5, -2)

$$\frac{-3-(-2)}{-3-5} = \frac{-1}{-8} = \frac{1}{8}$$

Write an equation in point-slope form of the line that passes through the given point and has the given slope  $m$ .

4. (2, 2);  $m = 5$

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

5. (7, 3);  $m = -1$

$$y = -1(x-7) + 3$$

6. (0, -4);  $m = 3$

$$y = 3(x-0) - 4$$

7. (-1, 7);  $m = 4$

$$y = 4(x+1) + 7$$

8. (-8, -5);  $m = 6$

$$y = 6(x+8) - 5$$

9. (4, -9);  $m = 2$

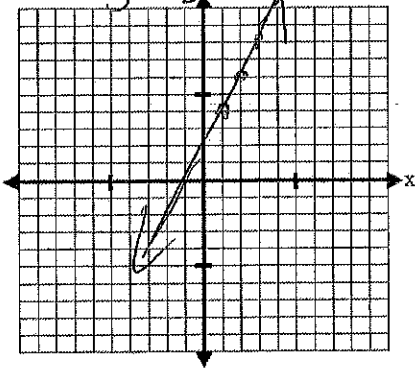
$$y = 2(x-4) - 9$$

$$y = 2(x-4) - 9$$

Graph the equation.

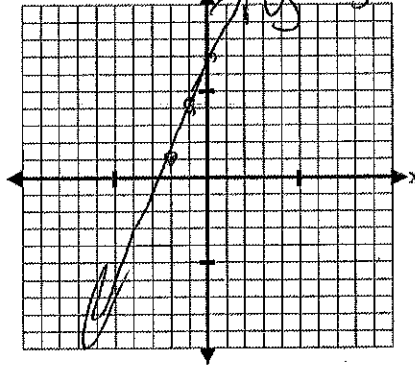
10.  $y - 4 = 2(x - 1)$

$$y = 2(x-1) + 4$$



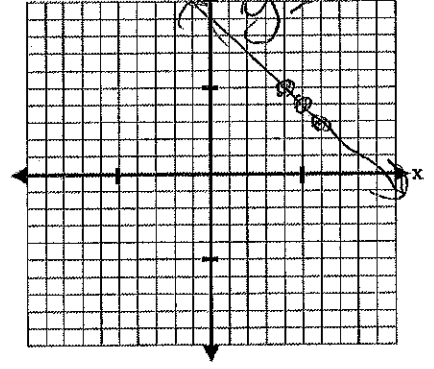
11.  $y - 1 = 3(x + 2)$

$$y = 3(x+2) + 1$$



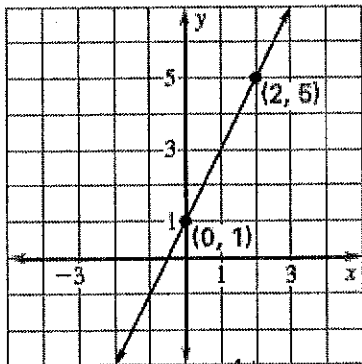
12.  $y - 5 = -1(x - 4)$

$$y = -1(x-4) + 5$$



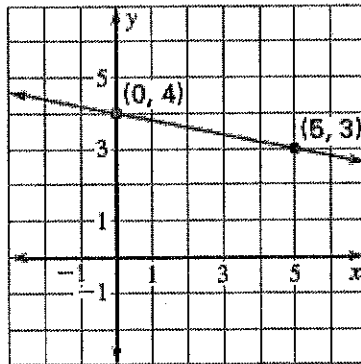
Write an equation of the line shown in point-slope form.

13.



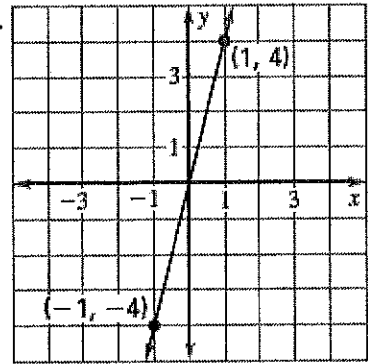
$$y = \frac{4}{2}(x-2) + 5$$

14.



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

15.



$$y = \frac{8}{2}(x-1) + 4$$