

Name: _____

Sec. 5.3: Write Linear Equations in Point-Slope Form

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

Example: $y - 5 = 3(x - 1)$

Point on the line:

Slope:

Example: $y - 4 = -2(x + 9)$

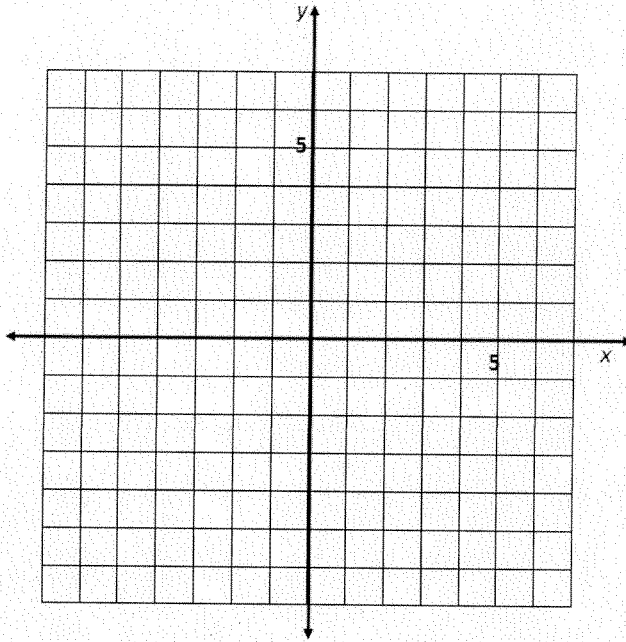
Point on the line:

Slope:

Examples

1. Write an equation in point-slope form of the line that passes through the point $(-1, 1)$ and has a slope of 4.
2. Write an equation in point-slope form of the line that passes through the points $(-4, 1)$ and $(2, 13)$.
3. The function $f(x) = 30 + 10(x - 5)$ represents the cost in dollars of ordering x paperbacks from a book club. Describe the function in terms of how much each book costs.
4. An online journal raises its subscription price by \$3 per year each year. After 6 years in existence, its subscription price is \$53. Write an equation in point-slope form that models the cost of a subscription as a function of how many years the journal has been published.

5. Graph the equation $y + 3 = 2(x + 1)$.



6. Tell whether the data in the table can be modeled by a linear equation. Explain. If possible, write an equation in point-slope form that relates y and x .

x	2	4	6	8	10
y	10	4	-2	-8	-14

Sec. 5.3 Practice Problems

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

1. $(5, 1)$; $m = 2$

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

3. $(-3, -11)$; $m = \frac{1}{2}$

4. $(-8, -3)$; $m = -1$

5. $(4, -2)$; $m = 1$

6. $(-3, 7)$; $m = -\frac{2}{5}$

Write an equation in point-slope form of the line that passes through the given points.

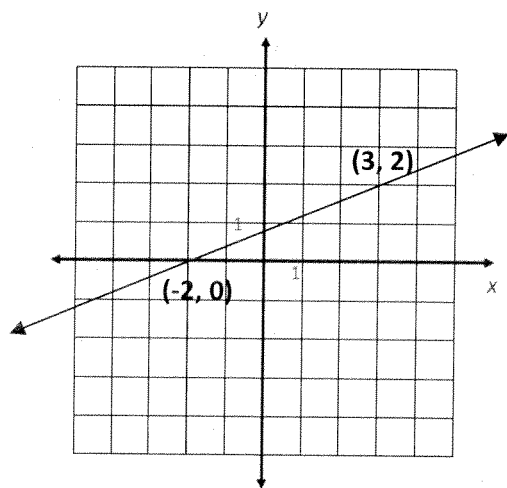
7. $(3, 2)$, $(4, 9)$

8. $(-2, 8)$, $(-6, 0)$

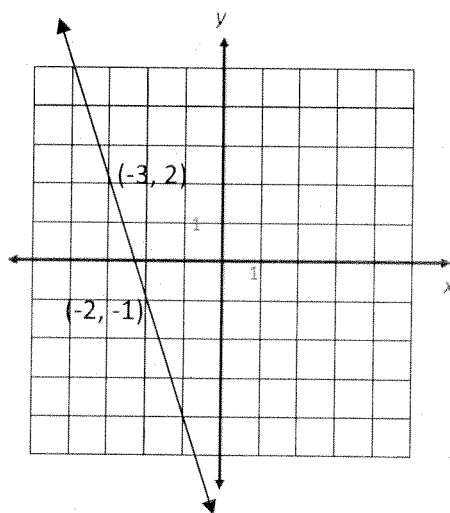
9. $(-5, \frac{3}{4})$, $(-2, -\frac{3}{4})$

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

10.



11.



12. The function $f(x) = 22 + 18(x - 1)$ represents the cost in dollars of ordering x Blu-ray discs from an online merchant. Describe the relationship in terms of how much each disc costs.

13. Tell whether the data in the table can be modeled by a linear equation. Explain. If possible, write an equation in point-slope form that relates y and x .

x	0	1	2	3	4
y	9	11.5	14	16.5	19

14. A small company's profit has been increasing by \$150,000 each year. After 8 years in business, the company makes a profit of \$1,700,000. Write an equation in point-slope form which models the profit as a function of how long the company has been in business.

ANSWERS to Sec. 5.3 Practice Problems

1. $y - 1 = 2(x - 5)$

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

3. $y + 11 = \frac{1}{2}(x + 3)$

4. $y + 3 = -(x + 8)$

5. $y + 2 = x - 4$

6. $y - 7 = -\frac{2}{5}(x + 3)$

7. $y - 2 = 7(x - 3)$ or $y - 9 = 7(x - 4)$

8. $y - 8 = 2(x + 2)$ or $y = 2(x + 6)$

9. $y - \frac{3}{4} = -\frac{1}{2}(x + 5)$ or $y + \frac{3}{4} = -\frac{1}{2}(x + 2)$

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

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

12. The first Blu-ray disc costs \$22; each additional disc costs \$18.

13. Yes it is linear because the rate of change is constant; $y - 9 = 2.5x$ as one example

14. $P - 1,700,000 = 150,000(t - 8)$