Quiz Review Lessons 2.1, 2.2 & 2.4   Key

Practice 2-1   Relations and Functions

1. Let function r be defined by $r(x) = 3x^2 - 5$

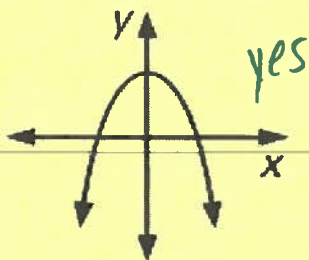a. Find r(7)   b. Find r(-5)   c. Find r(c)

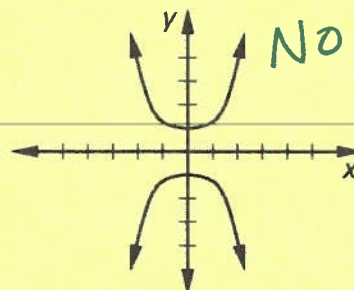$r(7) = 142$ $r(-5) = 70$ $r(c) = 3c^2 - 5$

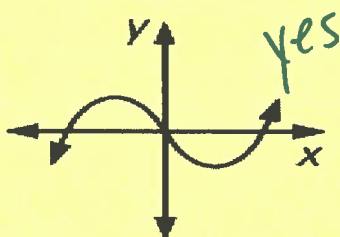2. Determine whether or not the graph represents a function.

a.

yes

b.

NO

c.

yes

d.
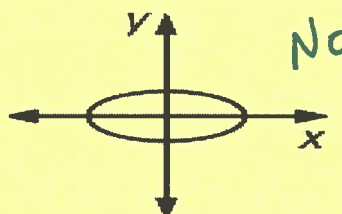
No

3. Consider the relation below:
   {(2,4), (4,8),(-2,-4),(-4,-8)}
   a. Graph the relation
   b. Find the domain
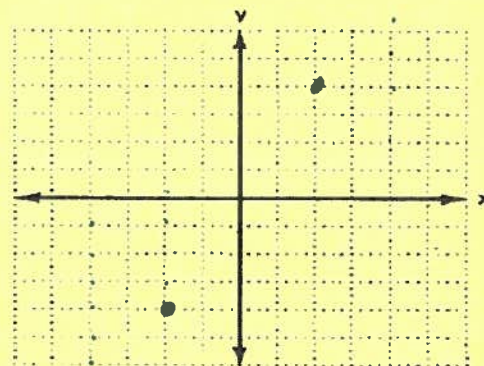 $\{2,4,-2,-4\}$
   c. Find the range
      $\{4,8,-4,-8\}$
   d. Is the relation a function? Why or why not?
      Yes; One output for every input

4. Consider the relation below:
   {(1,3),(1,-3),(2,6),(2,-6),(3,9),(3,-9)}
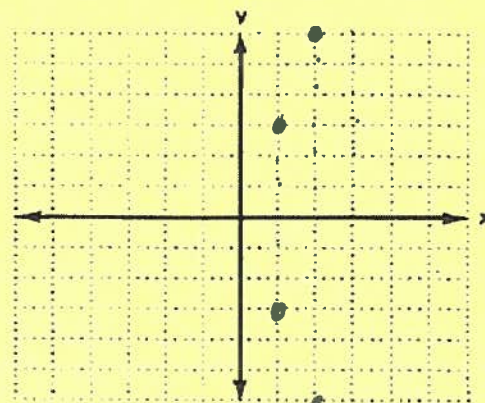   a. Graph the relation
   b. Find the domain
      $\{1,2,3\}$
   c. Find the range
      $\{3,-3,6,-6,9,-9\}$
   d. Is the relation a function? Why or why not?
      No; two outputs for the same input.
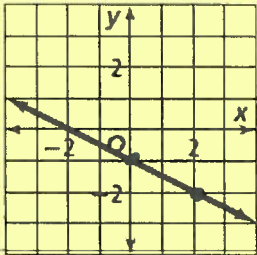
Find the slope of each line.

1. $5x - y = -7$ $\boxed{M = 5}$

$-y = -5x - 7$
$\frac{-y}{-1} = \frac{-5x}{-1} \frac{-7}{-1}$
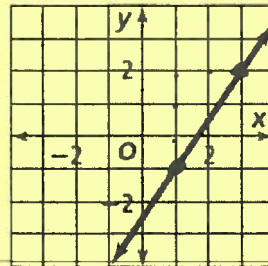$y = 5x + 7$

2. through $(4, -1)$ and $(-2, -3)$

$\frac{-3 + 1}{-2 - 4} = \frac{-2}{-6} = \frac{1}{3}$

3.

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

4.

$M = \frac{3}{2}$

Write in **standard form** an equation of the line with the given slope through the given point.

5. slope $= -4; (2, 2)$

$y - 2 = -4(x - 2)$
$y - 2 = -4x + 8$
$\quad +2 \qquad\qquad +2$
$+4x \quad y = -4x + 10$
$\qquad \quad +4x$
$\boxed{4x + y = 10}$

6. slope $= 3; (-1, 3)$

$y - 3 = 3(x + 1)$
$y - 3 = 3x + 3$
$\quad +3 \qquad\quad +3$
$y = 3x + 6$
$-3x \qquad -3x$
$-3x + y = 6$
$\frac{-3x + y}{-1} \frac{}{-1} = \frac{6}{-1}$ $\boxed{3x - y = -6}$

Write in **point-slope form** the equation of the line through each pair of points.

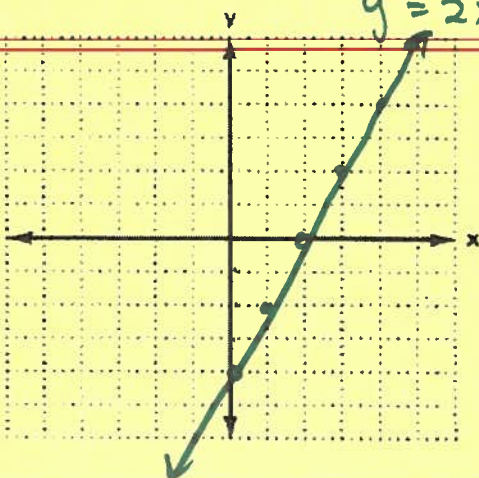7. $(-3, -2)$ and $(1, 6)$ $\frac{6 + +2}{1 + +3} = \frac{8}{4} = 2$ ⓐ $y - 6 = 2(x - 1)$
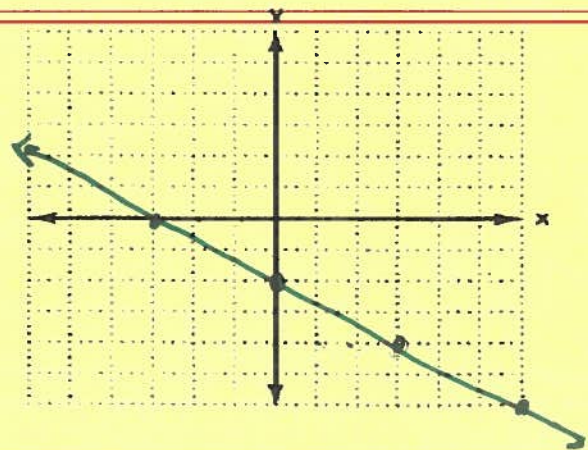ⓑ $y + 2 = 2(x + 3)$

Graph each equation.

8. $8x - 4y = 16$ $\frac{-4y}{-4} = \frac{-8x}{-4} \frac{+16}{-4}$
$y = 2x - 4$

9. $y = -\frac{2}{3}x - 2$

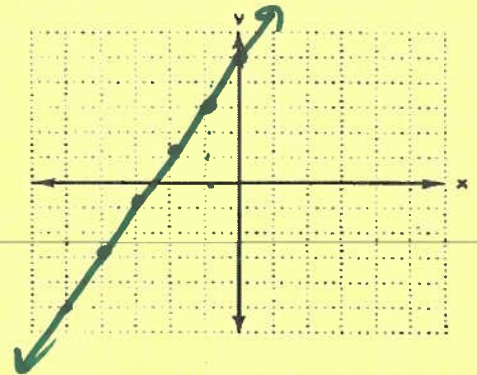Find the slope and the intercepts of each line.

10. $3x - 4y = 12$

11. $f(x) = \dfrac{4}{5}x + 7$

Write a **slope intercept** equation for each line. Then graph the line.

12. through $(-1, 3)$ and parallel to $y = 2x + 1$

$M = 2$

$y - 3 = 2\overparen{(x + 1)}$
$y - 3 = 2x + 2$
$y = 2x + 5$

13. through $(2, 2)$ and perpendicular to $y = -\dfrac{3}{5}x + 2$

$m = \dfrac{5}{3}$

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

$\begin{array}{l} y - 2 = \dfrac{5}{3}x - \dfrac{10}{3} + 2 \\ +2 \qquad\qquad\qquad +2 \end{array}$

$y = \dfrac{5}{3}x - \dfrac{4}{3}$

Write the equation in **standard form**.

14. $y = 2x - 1$

$-1\,(-2x + y = -1)$

$\boxed{2x - y = 1}$

15. $y = 4x + 2$

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

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

16. Find the slope of a line perpendicular to $2x - 5y = 3$.

$M = \dfrac{2}{5}$

$\boxed{\perp m = \dfrac{-5}{2}}$

$\begin{array}{l} -5y = -2x + 3 \\ \overline{-5} \qquad \overline{-5} \quad \overline{-5} \end{array}$

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

Write an equation for each line in <u>slope intercept</u> form.

1. y-intercept of –5, x-intercept of 3.5

$\left(0, -5\right)$

$\left(3.5, 0\right)$

$\dfrac{0+5}{3.5-0} = \dfrac{5}{3.5} = \dfrac{10}{7}$

$\boxed{y = \dfrac{10}{7}x - 5}$

2. through (2, 2), x-intercept of 10

$(2, 2)$

$(10, 0)$

$\dfrac{0-2}{10-2} = \dfrac{-2}{-8} = \dfrac{1}{4}$

$y - 0 = \dfrac{1}{4}(x - 10)$

$\boxed{y = \dfrac{1}{4}x - \dfrac{10}{4}}$

$\boxed{y = \dfrac{1}{4}x - \dfrac{5}{2}}$

For each situation, find a linear model (slope intercept form) and use it to make a prediction.

3. After 5 months the number of subscribers to a newspaper was 5730. After 7 months the number of subscribers to the newspaper was 6022. How many subscribers to the newspaper will there be after 10 months?

$(5, 5730)$

$(7, 6022)$

$\dfrac{6022 - 5730}{7 - 5} = \dfrac{292}{2} = 146$

$X = $ months
$y = \#$ of subscribers

$y - 5730 = 146(x - 5)$

$y - 5730 = 146x - 730$

$+ 5730 \qquad\qquad +5730$

$\boxed{y = 146x + 5000}$

$X = 10$

$y = 146(10) + 5000$

$\boxed{6460 \text{ subscr}}$

4. At a basketball game, student tickets are sold for $4.50 each.

a. Write an equation that models the income y from the sale of x student tickets.

$y = 4.50x$

b. How many student tickets must be sold to have $1125 in student ticket sales?

$y = 4.50x$

$X = $ student tickets

$y = $ income $

$1125 = 4.50x$

$X = 250$

$\boxed{250 \text{ student tickets}}$