

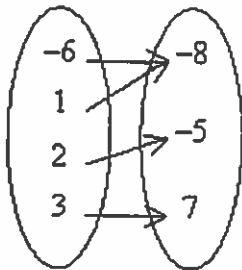
Unit 3 Practice Exam

Multiple Choice

Identify the choice that best completes the statement or answers the question.

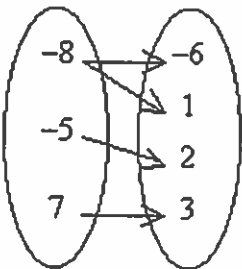
- A 1. A function is _____ a relation.
 a. always b. sometimes c. never
- D 2. Identify the mapping diagram that represents the relation and determine whether the relation is a function.
 $\{(-8, -6), (-5, 2), (-8, 1), (7, 3)\}$

a.



The relation is a function.

b.

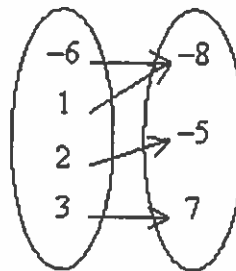


The relation is a function.

The length of a field in yards is a function $f(n)$ of the length n in feet. Write a function rule for this situation.

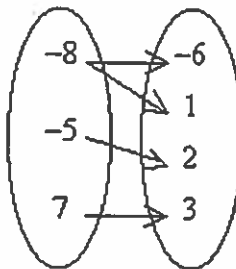
- B ~~a.~~ $f(n) = 3n$ b. $f(n) = \frac{1}{3}n$ c. $f(n) = 12n$ d. $f(n) = \frac{n}{12}$

c.



The relation is not a function

d.



The relation is not a function.

Short Answer

4. Evaluate $f(x) = -4x - 2$ for $x = -1$. $-4(-1) - 2$

$4 - 2$

2

5. Evaluate $f(x) = \frac{1}{2}x$ for $x = -3$.

$\frac{1}{2}(-3) = -\frac{3}{2} = -1.5$

6. Evaluate $f(x) = x^2 - 3$ for $x = -1$.

$-(-1)^2 - 3$

$-(1) - 3$

-4

7. A taxi company charges passengers \$1.25 for a ride, no matter how long the ride is, and an additional \$0.20 for each mile traveled. The rule $c = 0.20m + 1.25$ describes the relationship between the number of miles m and the total cost of the ride c .

a. What is the charge for a 1-mile ride?

$$C = 0.20(1) + 1.25 = 0.20 + 1.25 = 1.45$$

b. What is the charge for a 2.7-mile ride?

$$C = 0.20(2.7) + 1.25 = 0.54 + 1.25 = 1.79$$

Write a function rule for the table.

8.

x	$f(x)$
-2	6
-1	3
0	0
1	-3

$$f(x) = -3x$$

9.

x	$f(x)$
-3	0
-2	1
-1	2
0	3

$$f(x) = x + 3$$

The rate of change is constant in each table. Find the rate of change. Explain what the rate of change means for the situation.

10.

Time (hours)	Distance (miles)
4	260
6	390
8	520
10	650

+2
+2
+2

+130
+130

$$\frac{130 \text{ miles}}{2 \text{ hrs}}$$

$$65 \text{ mph}$$

Find the rate of change for the situation.

11. You run 5 miles in one hour and 20 miles in four hours.

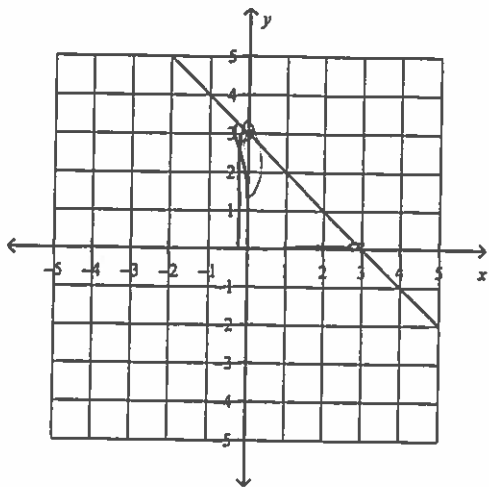
$$(1, 5), (4, 20) \quad \frac{20-5}{4-1} = \frac{15 \text{ miles}}{3 \text{ hrs}} = 5 \text{ mph}$$

12. A chef cooks 9 lbs of chicken for 36 people and 17 lbs of chicken for 68 people.

$$\frac{68-36 \text{ people}}{17-9} = \frac{32}{8} = 4 \text{ people/lb}$$

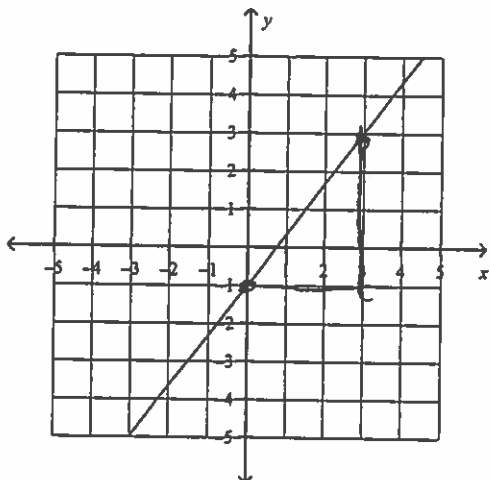
Find the slope of the line.

13.



$$\frac{-3}{3} = -1$$

14.



$$\frac{+4}{3}$$

Find the slope of the line that passes through the pair of points.

15. x_1, y_1, x_2, y_2
 $(1, 5), (10, 2)$

$$m = \frac{2 - 5}{10 - 1} = \frac{-3}{9} = \left(-\frac{1}{3}\right)$$

16. x_1, y_1, x_2, y_2
 $(0.9, -8.2), (2.9, -12.2)$

$$m = \frac{-12.2 - (-8.2)}{2.9 - 0.9} = \frac{-12.2 + 8.2}{2.0} = \frac{-4}{2} = (-2)$$

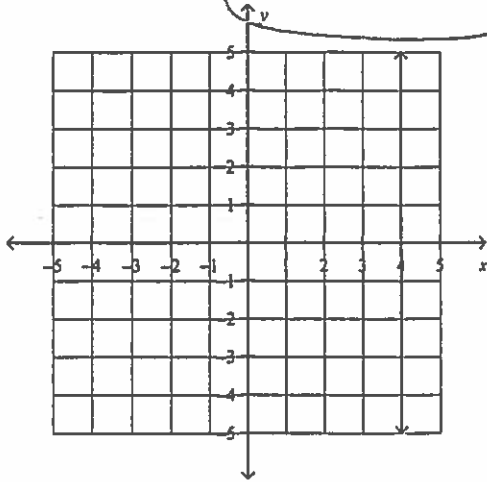
17. A student finds the slope of the line between $(11, 7)$ and $(5, 3)$. She writes $\frac{7-3}{5-11}$. What mistake did she make?

Switched order

$$\frac{7-3}{5-11}$$

State whether the slope is 0 or undefined.

18.



Find the slope and y-intercept of the line.

19. $y = \frac{6}{5}x + 1$ $m = \frac{6}{5}$
 $b = 1$

20. $6x + 4y = 20$ $m = -\frac{3}{2}$
 $\frac{4y}{4} = \frac{-6x + 20}{4}$ $y = -\frac{3}{2}x + 5$ $b = 5$

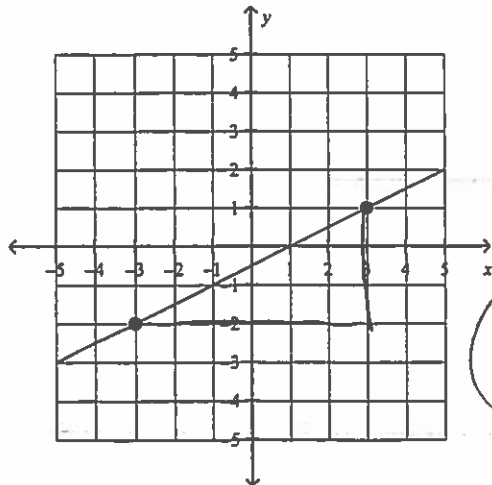
Write an equation of a line with the given slope and y-intercept.

21. $m = -5, b = -7$ $y = -5x - 7$

22. $m = -\frac{2}{3}, b = \frac{3}{2}$ $y = -\frac{2}{3}x + \frac{3}{2}$

Write the slope-intercept form of the equation for the line.

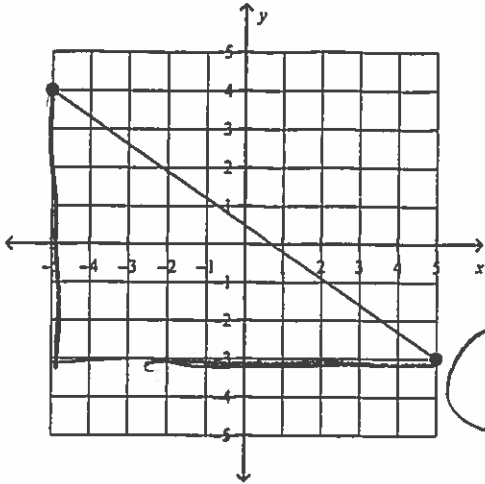
23.



$m = \frac{3}{6} = \frac{1}{2}$
 $b = -\frac{1}{2}$

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

24.



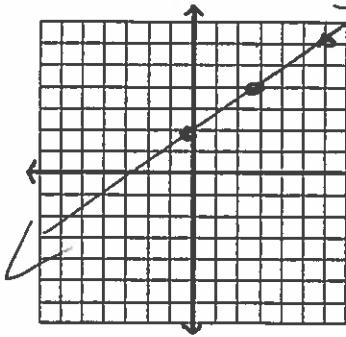
$$m = -\frac{7}{10}$$

$$b = \frac{1}{2}$$

$$y = -\frac{7}{10}x + \frac{1}{2}$$

25. Use the slope and y-intercept to graph the equation.

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



$$m = \frac{+2}{+3} \text{ up } 2 \text{ right } 3$$

$$b = 2$$

Find the x- and y-intercept of the line.

26. $2x + 3y = -18$

$$2x + \cancel{3y} = -18$$

$$\frac{2x}{2} = \frac{-18}{2}$$

$$x = -9$$

$$(x, 0)$$

$$\cancel{2x} + \frac{3y}{3} = \frac{-18}{3}$$

$$y = -6$$

$$(0, y)$$

27. $8x - 2y = 40$

$$8x - \cancel{2y} = 40$$

$$\frac{8x}{8} = \frac{40}{8}$$

$$x = 5$$

$$(x, 0)$$

$$\cancel{8x} - \frac{2y}{2} = \frac{40}{2}$$

$$y = -20$$

$$(0, y)$$

Graph the equation.

28. $y + 2 = -(x - 4)$

$(4, -2) \quad m = \frac{-1}{+1}$ OR

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

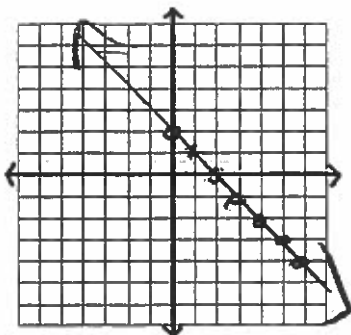
$$y + 2 = -1x + 4$$

$$\underline{-2 \quad -2}$$

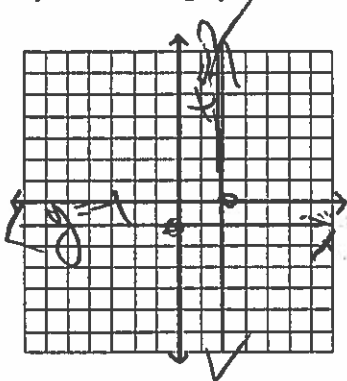
$$y = -1x + 2$$

$$m = \frac{-1}{+1}$$

$$b = 2$$



29. Graph the following equations on the graph paper below: $y = -1$; $x = 2$



Write an equation in point-slope form for the line through the given point with the given slope.

30. $(4, -6); m = \frac{3}{5}$ $y + 6 = \frac{3}{5}(x - 4)$

31. $(-8, 1); m = \frac{4}{5}$ $y + 1 = \frac{4}{5}(x + 8)$

32. A line passes through $(1, -5)$ and $(-3, 7)$.
 a. Write an equation for the line in point-slope form. $m = \frac{7 - (-5)}{-3 - 1} = \frac{7 + 5}{-3 - 1} = \frac{12}{-4} = -3$

b. Rewrite the equation in slope-intercept form.
 $y + 5 = -3(x - 1)$ OR $y - 7 = -3(x + 3)$
 $y + 5 = -3x + 3$ $y - 7 = -3x - 9$
 $y = -3x - 2$ $y = -3x - 9 + 7$

33. A line passes through $(-7, -4)$ and $(-2, 4)$.
 a. Write an equation for the line in point-slope form.

$$m = \frac{4 - (-4)}{-2 - (-7)} = \frac{4 + 4}{-2 + 7} = \frac{8}{5}$$

b. Rewrite the equation in slope-intercept form.

$y = -3x - 2$
 $y + 4 = \frac{8}{5}(x + 7)$
 $y - 4 = \frac{8}{5}(x + 2)$
 $y + 4 = \frac{8}{5}x + 11\frac{1}{5}$
 $y - 4 = \frac{8}{5}x + 3\frac{1}{5}$
 $y = \frac{8}{5}x + 7\frac{1}{5}$
 $y = \frac{8}{5}x + 7\frac{1}{5}$