

5-1 Practice

Rate of Change and Slope

Form K

Each rate of change is constant. Find the rate of change and explain what it represents.

1. Fences Painted

Hours	Fences
3	1
6	2
9	3
12	4

$$\frac{1}{3}$$

For every fence painted it takes 3 hours of time.

2. Miles Per Hour

Hours	Miles
2	70
4	140
6	210
8	280

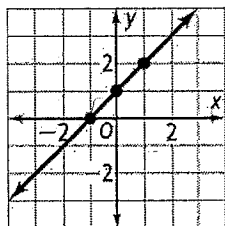
$$\frac{\Delta y}{\Delta x} = \frac{70}{2} = 35 \text{ mph}$$

Every two hours we travel 70 miles.

or
Every hour we travel 35 miles.

Find the slope of each line.

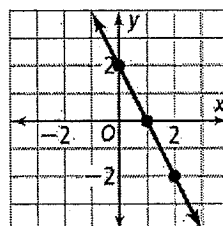
3.



$$\frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{1}{1}$$

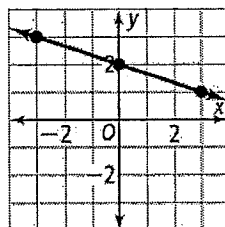
1

4.



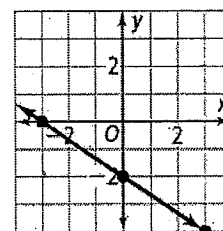
$$\frac{-2}{1} = -2$$

5.



$-\frac{1}{3}$

6.



$\frac{2}{3}$

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

7. $(-4, 5), (1, 1)$ $\frac{1-5}{1-(-4)} = \frac{-4}{5}$

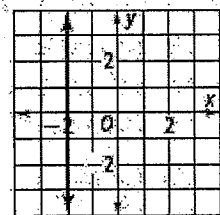
8. $(0, 0), (-1, 3)$ $\frac{3-0}{-1-0} = \frac{3}{-1} = -3$

9. $(2, 2), (3, 4)$ $\frac{4-2}{3-2} = \frac{2}{1} = 2$

10. $(5, 3), (-2, -4)$ $\frac{-4-3}{-2-5} = \frac{-7}{-7} = 1$

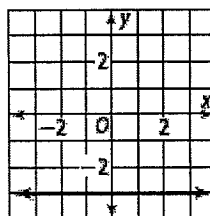
Find the slope of each line.

11.



undefined

12.



zero, or 0

5-1

Practice (continued)

Form K

Rate of Change and Slope

Without graphing, tell whether the slope of a line that models each linear relationship is *positive*, *negative*, *zero*, or *undefined*. Then find the slope.

13. The cost of a pair of jeans is \$22.50 for 1 pair and \$67.50 for 3 pairs.

positive

14. An employee earns \$28.50 after 3 hours and \$237.50 after 25 hours.

positive

State the independent variable and the dependent variable in each situation. Then find the rate of change for each situation.

15. The cost of three gallons of milk is \$8.85 and five gallons of milk is \$14.75.

independent variable: milk
dependent: price or dollars

16. Jacques filled 10 envelopes in 1 minute and 100 envelopes in 10 minutes.

How many envelopes can you fill? It depends on how long you stuff them for.

independent: time *dependent: # of envelopes*

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

17. $(7, -1), (7, 1)$ $\frac{1+1}{7-7} = \frac{2}{0}$

18. $(3, -2), (-2.5, 9)$

$\frac{9+2}{-2.5-3} = \frac{11}{-5.5} = -\frac{22}{11}$

19. $(\frac{1}{3}, \frac{2}{5}), (-\frac{1}{3}, \frac{3}{5})$ $\frac{\frac{3}{5} - \frac{2}{5}}{-\frac{1}{3} - \frac{1}{3}} = \frac{\frac{1}{5}}{-\frac{2}{3}}$

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

$\frac{\frac{5}{3} - \frac{2}{3}}{-\frac{3}{4} - \frac{3}{4}} = \frac{\frac{3}{3}}{0} = \frac{1}{0}$

$\frac{1}{5} \cdot \frac{3}{2} = \frac{3}{10}$ $-\frac{1}{3} - \frac{1}{3} = -\frac{2}{3}$

Undefined.

21. **Writing** Explain why the slope of a vertical line is always undefined.

Rise over run would give us a situation where we have zero in the denominator.

22. **Writing** Describe how to draw a line that passes through the origin and has a

slope of $\frac{3}{5}$. *The y-intercept is at zero. The line increases from left to right with a vertical change of 3 for every horizontal change of 5.*

Each pair of points lies on a line with the given slope. Find x or y.

23. $(2, 2), (5, y)$; slope = 2

$\frac{y-2}{5-2} = 2$

24. $(9, 4), (x, 6)$; slope = $-\frac{1}{3}$

$\frac{6-4}{x-9} = -\frac{1}{3}$

$\frac{2}{x-9} = -\frac{1}{3}$

$3 \cdot 2 = -1(x-9)$

$6 = -x + 9$

$-9 = -x$

$x = 9$

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

$9-2=6$
 $+2 \quad +2$
 $y=8$