Practice

Form G

3.1 Rate of Change and Slope

Determine whether each rate of change is constant. If it is, find the rate of change and explain what it represents.

1. Hockey Team's Offense

Games	Goals
1	2
2	4
3	6

yes; 2; goals per games played

2. Miles Per Gallon

Gallons	Miles
1	28
3	84
5	140
7	196

yes; 28; miles per gallon

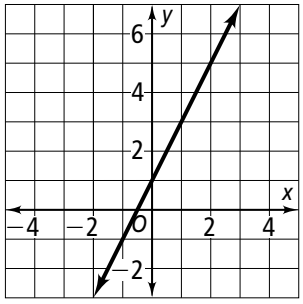
3. Cars Washed

Hours	Cars
1	4
2	8
3	12
4	16

yes; 4; cars washed per hour

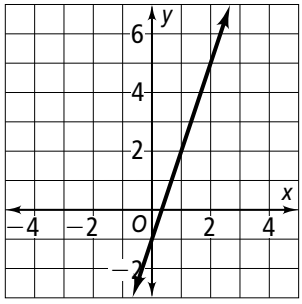
Find the slope of each line.

4.



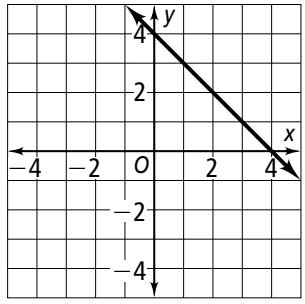
2

5.



3

6.



−1

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

7. $(2, 1), (0, 0)$ $\frac{1}{2}$

8. $(4, 5), (6, 2)$ $-\frac{3}{2}$

9. $(3, 8), (7, 3)$ $-\frac{5}{4}$

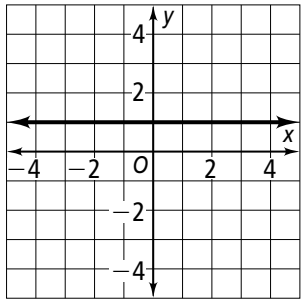
10. $(1, 0), (-4, 2)$ $-\frac{2}{5}$

11. $(8, -4), (-6, -3)$ $-\frac{1}{14}$

12. $(-2, -3), (6, 5)$ 1

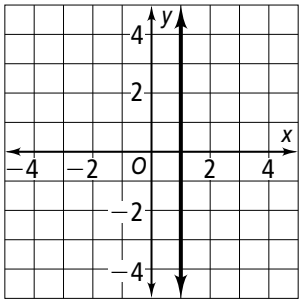
Find the slope of each line.

13.



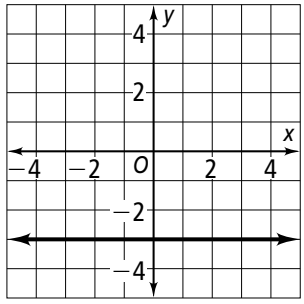
0

14.



undefined

15.



0

3.1 Rate of Change and Slope

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

16. The cost of tickets to the amusement park is \$19.50 for 1 ticket and \$78 for 4 tickets. positive; 19.5

17. The late fee is \$2 regardless of the number of days the movie is late. zero; 0

18. On the trip, Jerry had his cruise control set at 60 mi/h for 4 hours. zero; 0

19. The contract states that every day past the agreed upon completion date the project is not finished, the price is reduced by \$25. negative; -25

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

20. Shelly delivered 12 newspapers after 20 minutes and 36 papers after 60 minutes.
ind: time; dep: number of papers delivered; 0.6 papers/min

21. Two pounds of apples cost \$3.98. Six pounds cost \$11.94.
ind: weight; dep: cost; \$1.99/lb

22. An airplane ascended 3000 feet in 10 minutes and 4500 feet in 15 minutes.
ind: time; dep: height; 300 ft/min

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

23. $(-5, 0), (-5, 5)$
undefined

24. $(-2, -4), (-1.5, -1.5)$
5

25. $(4.75, -3.575), (2.25, 1.425)$
-2

26. $\left(-\frac{1}{4}, \frac{3}{4}\right), \left(\frac{1}{2}, -\frac{3}{4}\right)$
-2

27. $\left(\frac{2}{5}, \frac{3}{7}\right), \left(\frac{1}{5}, \frac{4}{7}\right)$
$-\frac{5}{7}$

28. $(-3.35, 6.5), (5.65, -3.5)$
$-\frac{10}{9}$

29. Writing Explain why the slope of a horizontal line is always zero.
The change in the dependent variable is 0 and $\frac{0}{a} = 0$

30. Writing Describe how to draw a line that passes through the origin and has a slope of $-\frac{2}{3}$.
On a coordinate grid, plot (0, 0). Move down 2 and right 3 and plot the point (3, -2). Draw a line through the points.

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

31. $(7, 4), (3, y)$; slope $= \frac{1}{4}$
3

32. $(5, y), (6, 4)$; slope $= 0$
4

33. $(x, 5), (-3, 6)$; slope $= -1$
-2

34. $(-12, 9), (x, -2)$; slope $= -\frac{1}{2}$
10