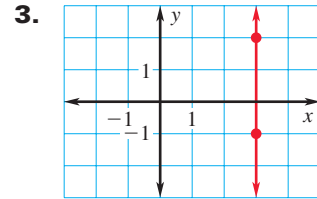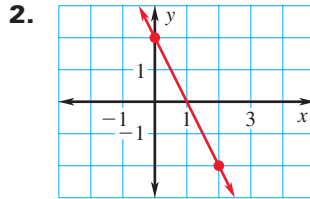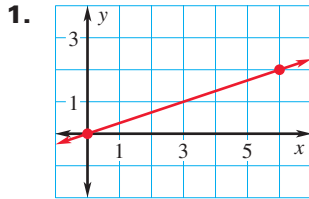**LESSON 1.5** | **Exercise Set A**

MM1A1g Explore rates of change, comparing constant rates of change (i.e., slope) versus variable rates of change. Compare rates of change of linear, quadratic, square root, and other function families.

Tell whether the slope of the line is *positive*, *negative*, *zero*, or *undefined*.

1.

2.

3.

Plot the points and draw a line through them. Without calculating, tell whether the slope of the line is *positive*, *negative*, *zero*, or *undefined*.

4. $(1, -4)$ and $(5, -8)$

5. $(-3, 6)$ and $(-3, 0)$

6. $(-3, 3)$ and $(7, -1)$

7. $(0, -2)$ and $(9, -5)$

8. $(7, 1)$ and $(-2, 1)$

9. $(-3, -1)$ and $(6, -2)$

10. $(-4, -5)$ and $(-3, -2)$

11. $(-7, 1)$ and $(-7, -8)$

12. $(2, -10)$ and $(12, 10)$

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

13.

14.

15.

16.

17.

18.
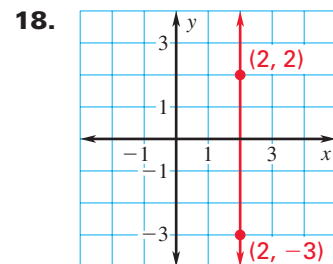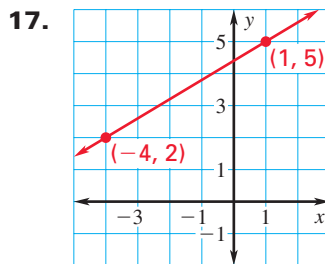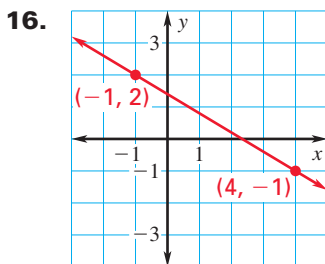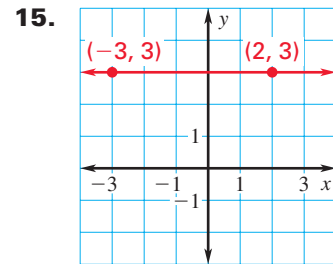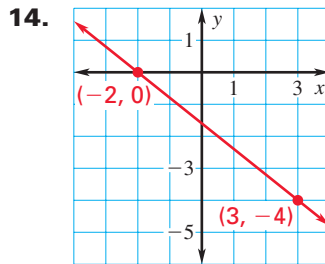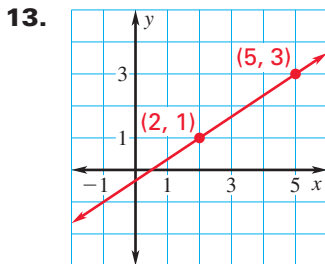
Find the slope of the line that passes through the points.

19. $(1, 2)$ and $(7, 7)$

20. $(3, 4)$ and $(-5, 0)$

21. $(5, -2)$ and $(5, 8)$

22. $(3, 1)$ and $(-5, 3)$

23. $(-7, 1)$ and $(1, 5)$

24. $(2, -5)$ and $(5, -2)$

25. $(3, 0)$ and $(8, 0)$

26. $(-6, -6)$ and $(-2, -2)$

27. $(-5, -4)$ and $(1, -2)$

28. Error Analysis *Describe* and correct the error in calculating the slope of the line that passes through the points (3, 2) and (1, 4).

> The slope of the line through (3, 2) and (1, 4) is
>
> $$m = \frac{4-2}{3-1} = \frac{2}{2} = 1.$$
>
> ✗

Find the value of *x* or *y* so that the line passing through the two points has the given slope.

29. $(-3, y), (-9, -2); m = 1$

30. $(-1, 4), (x, 3); m = \frac{1}{5}$

31. $(8, 1), (1, y); m = -1$

32. $(x, -7), (1, 2); m = 3$

33. $(9, y), (3, 2); m = \frac{2}{3}$

34. $(7, 5), (x, 2); m = \frac{3}{4}$

35. Trolley Bus The table shows the number of trolley buses in operation in the United States during certain years.

Year	1980	1985	1990	1995	2000
Number of buses	823	676	832	885	951

a. *Describe* the rates of change in the number of buses during the time period.

b. Determine the 5-year time intervals during which the number of trolley buses showed the greatest positive and least positive rates of change.

36. Postage Rate The graph shows the cost (in dollars) to mail a letter that weighs one ounce during certain years.

a. Consider the time intervals between the labeled points. Determine the time interval during which the cost to mail a one-ounce letter showed the greatest rate of change.

b. Determine the time interval during which the cost to mail a one-ounce letter showed the least rate of change.

37. Heart Rate The graph shows the heart rate of a person during 30 minutes of exercise. Give a verbal description of the workout.
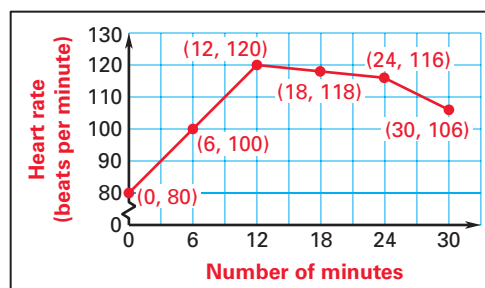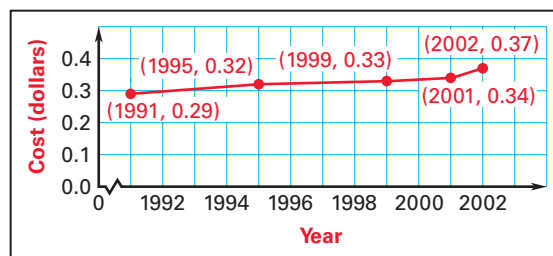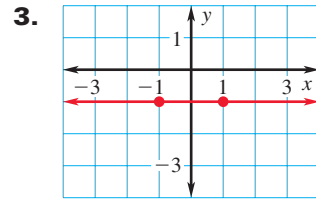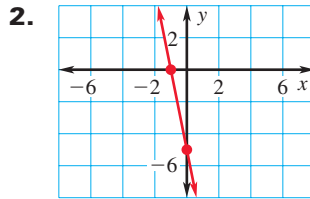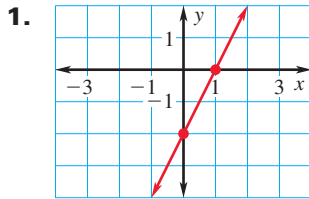
LESSON 1.5 **Exercise Set B**

MM1A1g Explore rates of change, comparing constant rates of change (i.e., slope) versus variable rates of change. Compare rates of change of linear, quadratic, square root, and other function families.

Tell whether the slope of the line is *positive*, *negative*, *zero*, or *undefined*.

1.

2.

3.

Plot the points and draw a line through them. Without calculating, tell whether the slope of the line is *positive*, *negative*, *zero*, or *undefined*.
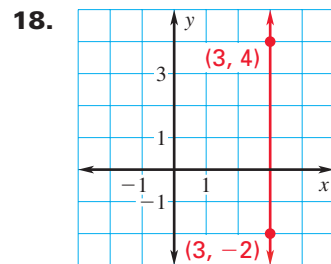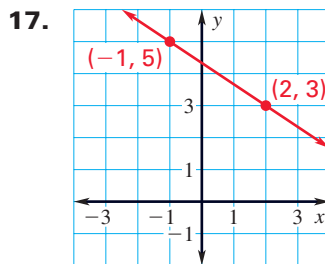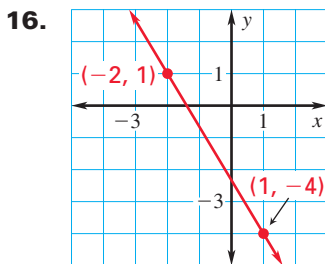
4. $(2, -5)$ and $(6, -9)$

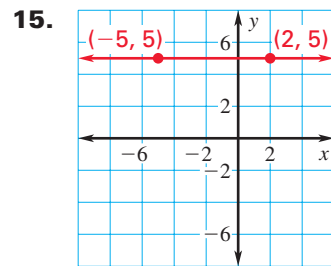**5.** $(-4, 5)$ and $(-4, -2)$

6. $(-6, -2)$ and $(-1, -8)$

7. $(5, 3)$ and $(-4, 3)$

8. $(-7, 2)$ and $(3, -2)$

9. $(6, -4)$ and $(-5, -8)$

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

10.

11.

12.

13.

14.

15.

16.

17.

18.

UNIT 1
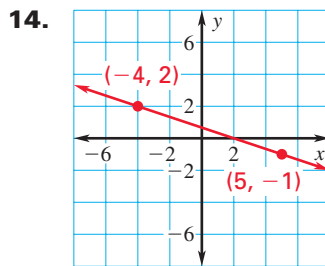
Exercise Set B *(continued)*

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

19. (3, 4) and (8, 7)
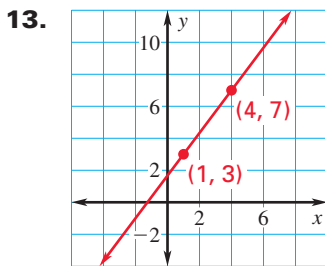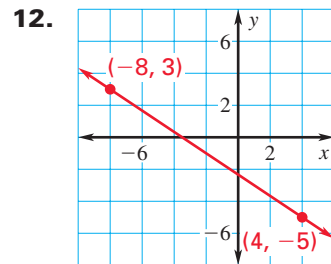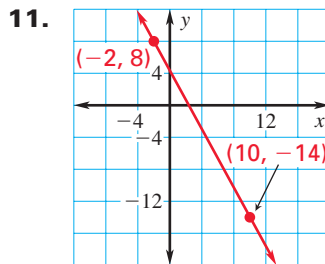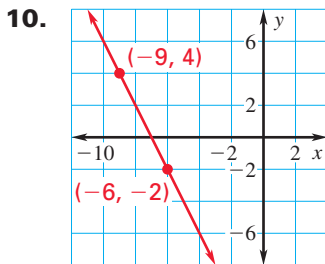
20. (5, 5) and (−2, 1)

21. (6, −1) and $\left(6, \frac{1}{2}\right)$

22. (4, 2) and (−6, 6)

23. (−3, 4) and (4, 8)

24. (1, −9) and (6, −5)

25. (2, −5) and (5, −5)

26. (−8, −7) and (−4, −2)

27. (−2, −6) and (4, −5)

28. **Error Analysis** *Describe* and correct the error in calculating the slope of the line that passes through the points (6, 5) and (2, 7).

> The slope of the line through (6, 5) and (2, 7) is
> $$m = \frac{7-5}{6-2} = \frac{2}{4} = \frac{1}{2}.$$
> ✗

Find the value of *x* or *y* so that the line passing through the two points has the given slope.

29. (−3, y), (−9, −2); m = 1

30. (−2, 8), (x, 4); $m = \frac{4}{5}$

31. (7, 5), (1, y); $m = -\frac{2}{3}$

32. (x, 8), (2, −1); m = −3

33. (−1, 5), (−6, y); $m = \frac{8}{5}$

34. (−7, −1), (−2, y); $m = -\frac{3}{5}$

35. **Biking** Every day, you ride your bike home from school. The graph shows the distance you are from home during your 20-minute bike ride.

a. Determine the 5-minute time interval during which the distance from home decreased the most.

b. Determine the 5-minute time interval during which the distance from home decreased the least.

c. Give a verbal description of your ride home.

Biking
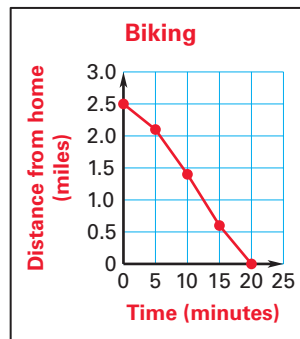
36. **Fuel Consumption** The graph shows the fuel consumption (in miles per gallon) of cars and vans, pickups, and SUVs from 1990 to 2000.

a. During which two-year period did the fuel consumption of vans, pickups, and SUVs decrease the least?

b. During which two-year period did the fuel consumption of cars increase the least?

c. How did the fuel consumption for the types of vehicles change during the 10-year period? *Explain* your reasoning.

Fuel Consumption

UNIT 1