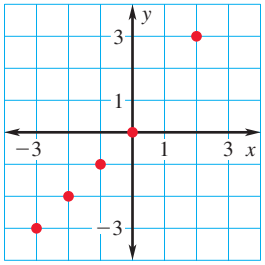
LESSON 1.8

Exercise Set A

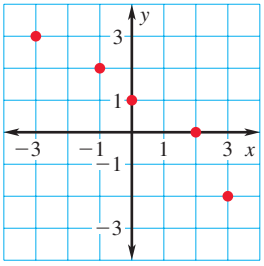
MM1A1d Investigate and explain the characteristics of a function: domain, range, zeros, intercepts, intervals of increase and decrease, maximum and minimum values, and end behavior.

Find the equation of the best-fitting line. Approximate the value of y for $x = 1$.

1.



2.



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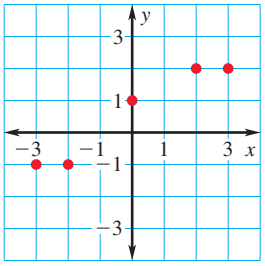


Make a scatter plot of the data. Find the equation of the best-fitting line. Approximate the value of y for $x = 3$.

4.

x	−1	0	1	2	4
y	3	3	1	0	−3

5.

x	−1	0	1	2	4
y	−1	1	2	1	5

6.

x	−2	−1	0	1	2
y	−3	−1	1	3	2

7.

x	−2	−1	0	1	2
y	4	4	3	1	−1

Make a scatter plot of the data. Find the equation of the best-fitting line. Approximate the value of y for $x = 5$.

8.

x	−1	0	1	2	3
y	5	3	2	0	−2

9.

x	−5	−3	−1	1	2
y	−4	−2	−1	1	0

10.

x	−2	−1	0	1	2
y	−4	−2	−1	−1	1

11.

x	−1	0	1	2	3
y	−2	0	1	3	5

12.

x	−3	−1	1	2	3
y	4	1	0	−1	−3

13.

x	−4	−2	0	1	3
y	3	3	1	0	−2

UNIT 1

Exercise Set A *(continued)*

Find the zero of the function.

14. $f(x) = 16x - 4$

15. $f(x) = 2 - 4x$

16. $f(x) = 0.5x + 5$

17. $f(x) = -0.1x - 3$

18. $f(x) = \frac{3}{4}x - 3$

19. $f(x) = -\frac{2}{5}x + 4$

20. $f(x) = 0.25x + 0.5$

21. $f(x) = 9 - 0.7x$

22. $f(x) = 1.2x + 10$

23. $f(x) = \frac{1}{2}x - 6$

24. $f(x) = -\frac{2}{5}x - 4$

25. $f(x) = -0.8x + 15$

26. $f(x) = 1.25x - 5$

27. $f(x) = 6 - 0.2x$

28. $f(x) = 2.5x - 3$

29. Profit The table shows the monthly profit of a small company.

Month	January	February	March	April	May
Profit (dollars)	1200	1250	1400	1380	1450

a. Make a scatter plot of the data. Let x represent the number of months since January and let y represent the profit.

b. Find an equation that models the profit (in dollars) as a function of the number of months since January.

c. Approximate the profit in August.

30. Multiple Representations The table shows several planet diameters and escape velocities. The escape velocity is the velocity at which an object has to travel in order to escape the effect of a planet's gravity.

Planet	Mercury	Uranus	Earth	Mars	Venus
Diameter (km)	4879	51,118	12,756	6794	12,104
Escape velocity (km/sec)	4.3	21.3	11.186	5.03	10.36

a. Drawing a Graph Make a scatter plot of the data. Let x represent the diameter of the planet and let y represent the escape velocity.

b. Writing an Equation Find an equation that models the escape velocity (in kilometers per second) as a function of the diameter (in kilometers).

c. Approximating a Value Approximate the escape velocity of Neptune, which has a diameter of 49,528 kilometers.

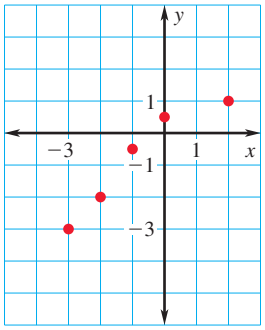
LESSON 1.8

Exercise Set B

MM1A1d Investigate and explain the characteristics of a function: domain, range, zeros, intercepts, intervals of increase and decrease, maximum and minimum values, and end behavior.

Find the equation of the best-fitting line. Approximate the value of *y* for *x* = 1.

1.



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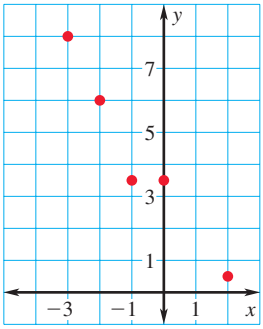
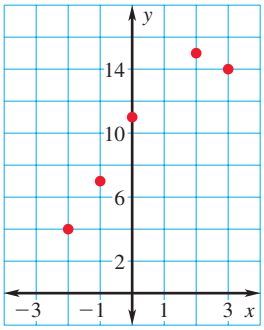


3.



Make a scatter plot of the data. Find the equation of the best-fitting line. Approximate the value of *y* for *x* = −2.

4.

x	−5	−3	−1	1	2
y	1	0	−2	−2	−3

5.

x	−4	−3	−1	1	2
y	−4	−3.2	−2.5	−2	−1

6.

x	−3	−1	0	2	3
y	−2.5	−1.5	−1	1	2.4

7.

x	−5	−3	0	1	3
y	3	1.6	−0.7	−1.8	−2.1

Make a scatter plot of the data. Find the equation of the best-fitting line. Approximate the value of *y* for *x* = 1.25.

8.

x	−3	−2	−1	0	1
y	3	1.5	0.25	−1	−3

9.

x	−3	−2	−1	0	1
y	−1	0	0.25	0.75	2

10.

x	−4	−3	−2	−1	0
y	6	4	3	3	1

11.

x	−3	−2	−1	0	1
y	−3	−1	0	2	4

12.

x	−4	−3	−2	0	1
y	−3	−1.5	−1	0.5	2

13.

x	−5	−4	−2	−1	0
y	2	0	−0.5	−0.5	−2

Exercise Set B *(continued)*

Find the zero of the function.

14. $f(x) = 4.8x + 1.2$

15. $f(x) = 2.5x - 0.5$

16. $f(x) = 1.5x - 0.3$

17. $f(x) = -0.4x - 0.36$

18. $f(x) = 52 - 1.3x$

19. $f(x) = \frac{3}{4}(x - 8)$

20. $f(x) = -3(x + 4)$

21. $f(x) = 4(2x - 1)$

22. $f(x) = 6(3x + 5) - 4$

23. $f(x) = 4(3x - 3) + 2$

24. $f(x) = \frac{1}{2}(4x - 3) + 1$

25. $f(x) = -\frac{2}{3}(6x - 3) + 2$

26. $f(x) = -3\left(\frac{3}{4}x + 5\right)$

27. $f(x) = 4\left(-\frac{1}{2}x + 5\right)$

28. $f(x) = \frac{1}{2}\left(\frac{4}{3}x - 6\right)$

29. Computers The table shows the percent of U.S. households with computers from 1995 to 2000.

Year	1995	1996	1997	1998	1999	2000
Percent with computers	31.7	35.5	39.2	42.6	48.2	53.0

a. Make a scatter plot of the data where x represents the number of years since 1995 and y represents the percent of households with computers.

b. Find an equation that models the percent of households as a function of the number of years since 1995.

c. Predict how many households will have computers in 2009.

d. Find the zero of the function. *Explain* what the zero means in this situation.

30. Multiple Representations The table shows the sales (in millions of dollars) of corded telephones in the United States from 1990 to 2002.

Year	1990	1999	2000	2001	2002
Sales (millions of dollars)	765	688	678	666	660

a. Drawing a Graph Make a scatter plot of the data where x represents the number of years since 1990 and y represents the sales (in millions of dollars).

b. Writing an Equation Find an equation that models the sales as a function of the number of years since 1990.

c. Analyzing a Model How well do you think your model fits the data? *Explain* your reasoning.

d. Estimating a Value Use your model to estimate the sales in 1995.

e. Analyzing a Model The actual sales in 1995 were 668 million dollars. How well does this fit with your answer to part (d)? Do you think your model is still a good model? *Explain.*