Cumulative Review: Chapters 1–3

1. Evaluate $\frac{x}{5y}$ for $x = 70$ and $y = 2$. [1.1]

2. Multiply: $6(2a - b + 3)$. [1.2]

3. Factor: $8x - 4y + 4$. [1.2]

4. Find the prime factorization of 54. [1.3]

5. Find decimal notation: $-\frac{3}{20}$. [1.4]

6. Find the absolute value: $|-37|$. [1.4]

7. Find the opposite of $-\frac{1}{10}$. [1.6]

8. Find the reciprocal of $-\frac{1}{10}$. [1.7]

9. Find decimal notation: 36.7%. [2.4]

Simplify.

10. $\frac{3}{5} - \frac{5}{12}$ [1.3]

11. $3.4 + (-0.8)$ [1.5]

12. $(-2)(-1.4)(2.6)$ [1.7]

13. $\frac{3}{8} \div \left(-\frac{9}{10}\right)$ [1.7]

14. $1 - [32 \div (4 + 2^2)]$ [1.8]

15. $-5 + 16 \div 2 \cdot 4$ [1.8]

16. $y - (3y + 7)$ [1.8]

17. $3(x - 1) - 2[x - (2x + 7)]$ [1.8]

Solve.

18. $2.7 = 5.3 + x$ [2.1]

19. $\frac{5}{3}x = -45$ [2.1]

20. $3x - 7 = 41$ [2.2]

21. $\frac{3}{4} = \frac{-n}{8}$ [2.1]

22. $14 - 5x = 2x$ [2.2]

23. $3(5 - x) = 2(3x + 4)$ [2.2]

24. $\frac{1}{4}x - \frac{2}{3} = \frac{3}{4} + \frac{1}{3}x$ [2.2]

25. $y + 5 - 3y = 5y - 9$ [2.2]

26. $x - 28 < 20 - 2x$ [2.6]

27. $2(x + 2) \geq 5(2x + 3)$ [2.6]

28. Solve $A = 2\pi rh + \pi r^2$ for h. [2.3]

29. In which quadrant is the point $(3, -1)$ located? [3.1]

30. Graph on a number line: $-1 < x \leq 2$. [2.6]

31. Use a grid 10 squares wide and 10 squares high to plot $(-150, -40)$, $(40, -7)$, and $(0, 6)$. Choose the scale carefully. [3.1]

Graph.

32. $x = 3$ [3.3]

33. $2x - 5y = 10$ [3.3]

34. $y = -2x + 1$ [3.2]

35. $y = \frac{2}{3}x$ [3.2]

36. $y = -\frac{3}{4}x + 2$ [3.6]

37. $2y - 5 = 3$ [3.3]

Find the coordinates of the x- and y-intercepts. Do not graph.

38. $2x - 7y = 21$ [3.3]

39. $y = 4x + 5$ [3.3]

40. Find the slope and the y-intercept of the line given by $3x - y = 2$. [3.6]

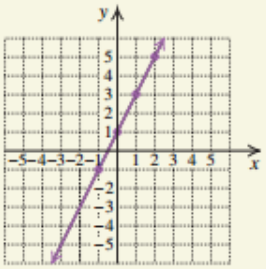
41. Find the slope of the line containing the points $(-4, 1)$ and $(2, -1)$. [3.5]

42. Write an equation of the line with slope $\frac{2}{7}$ and y-intercept $(0, -4)$. [3.6]

43. Write a point–slope equation of the line with slope $-\frac{3}{8}$ that contains the point $(-6, 4)$. [3.7]

44. Write the slope–intercept form of the equation in Exercise 43. [3.6]

45. Determine an equation for the following graph. [3.6], [3.7]



Solve.

46. U.S. bicycle sales rose from 15 million in 1995 to 20 million in 2005. Find the rate of change of bicycle sales. [3.4]
Sources: National Bicycle Dealers Association; U.S. Department of Transportation

47. A 150-lb person will burn 240 calories per hour when riding a bicycle at 6 mph. The same person will burn 410 calories per hour when cycling at 12 mph. [3.7]
Source: American Heart Association

a) Graph the data and determine an equation for the related line. Let r = the rate at which the person is cycling and c = the number of calories burned per hour.

b) Use the equation of part (a) to estimate the number of calories burned per hour by a 150-lb person cycling at 10 mph.

48. Americans spent an estimated $238 billion on home remodeling in 2006. This was $\frac{17}{15}$ of the amount spent on remodeling in 2005. How much was spent on remodeling in 2005? [2.5]
Source: National Association of Home Builders' Remodelers Council

49. In 2005, the mean earnings of individuals with a high school diploma was $29,448. This was about 54% of the mean earnings of those with a bachelor's degree. What were the mean earnings of individuals with a bachelor's degree in 2005? [2.4]
Source: U.S. Census Bureau

50. Recently there were 132 million Americans with either O-positive or O-negative blood. Those with O-positive blood outnumbered those with O-negative blood by 90 million. How many Americans had O-negative blood? [2.5]
Source: American Red Cross

51. Tina paid $126 for a cordless drill, including a 5% sales tax. How much did the drill itself cost? [2.4]

52. A 143-m wire is cut into three pieces. The second is 3 m longer than the first. The third is four fifths as long as the first. How long is each piece? [2.5]

53. In order to qualify for availability pay, a criminal investigator must average at least 2 hr of unscheduled duty per workday. For the first four days of one week, Alayna worked 1, 0, 3, and 2 extra hours. How many extra hours must she work on Friday in order to qualify for availability pay? [2.7]
Source: U.S. Department of Justice

Synthesis

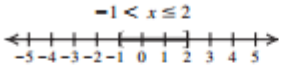
Skip the synthesis questions

ANSWERS – Cumulative Review Chapters 1 to 3

Cumulative Review: Chapters 1–3, pp. 224–225

1. 7 **2.** $12a - 6b + 18$ **3.** $4(2x - y + 1)$ **4.** $2 \cdot 3^3$
5. -0.15 **6.** 37 **7.** $\frac{1}{10}$ **8.** -10 **9.** 0.367 **10.** $\frac{11}{60}$
11. 2.6 **12.** 7.28 **13.** $-\frac{5}{12}$ **14.** -3 **15.** 27
16. $-2y - 7$ **17.** $5x + 11$ **18.** -2.6 **19.** -27
20. 16 **21.** -6 **22.** 2 **23.** $\frac{7}{9}$ **24.** -17 **25.** 2
26. $\{x|x < 16\}$, or $(-\infty, 16)$ **27.** $\left\{x|x \le -\frac{11}{8}\right\}$, or $\left(-\infty, -\frac{11}{8}\right]$ **28.** $h = \dfrac{A - \pi r^2}{2\pi r}$ **29.** IV

30.



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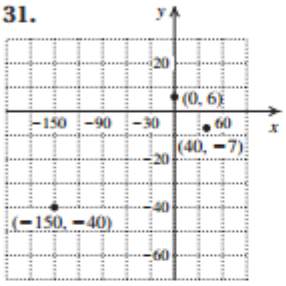

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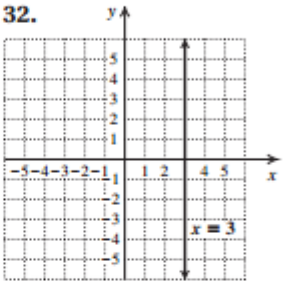

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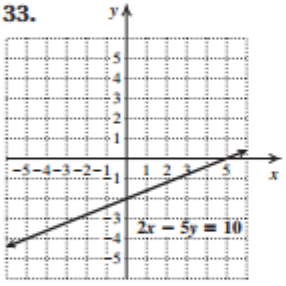

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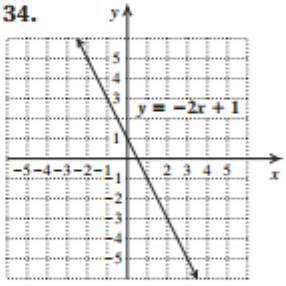

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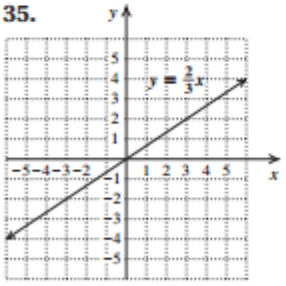

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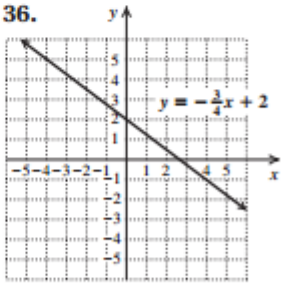
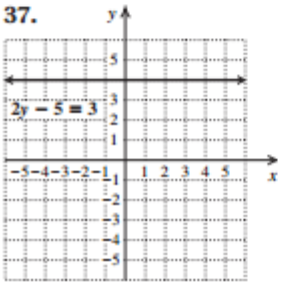
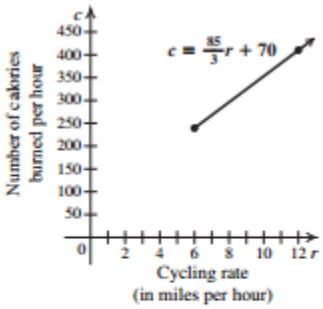


37.



38. $\left(\frac{21}{2}, 0\right), (0, -3)$
39. $\left(-\frac{5}{4}, 0\right), (0, 5)$
40. 3; $(0, -2)$ **41.** $-\frac{1}{3}$
42. $y = \frac{2}{7}x - 4$
43. $y - 4 = -\frac{3}{8}(x - (-6))$
44. $y = -\frac{3}{8}x + \frac{7}{4}$
45. $y = 2x + 1$
46. 0.5 million bicycles per year

47. (a)



(b) about 353 calories per hour

48. \$210 billion **49.** \$54,533 **50.** 21 million Americans
51. \$120 **52.** 50 m, 53 m, 40 m **53.** 4 hr
54. \$25,000 **55.** $-4, 4$ **56.** 2 **57.** -5 **58.** 3
59. No solution **60.** $Q = \dfrac{2 - pm}{p}$
61. $y = -\frac{7}{3}x + 7; y = -\frac{7}{3}x - 7; y = \frac{7}{3}x - 7; y = \frac{7}{3}x + 7$