Cumulative Review for Chapter 1 to 3 and 5 to 6

Simplify. Do not use negative exponents in the answer.

1. $\frac{3}{8} \div \frac{3}{4}$ [1.3]
2. $\frac{3}{8} \cdot \frac{3}{4}$ [1.3]
3. $\frac{3}{8} + \frac{3}{4}$ [1.3]
4. $-2 + (20 \div 4)^2 - 6 \cdot (-1)^3$ [1.8]
5. $(3x^2y^3)^{-2}$ [5.2]
6. $(t^2)^3 \cdot t^4$ [5.1]
7. $(3x^4 - 2x^2 + x - 7) + (5x^3 + 2x^2 - 3)$ [5.4]
8. $(a^2b - 2ab^2 + 3b^3) - (4a^2b - ab^2 + b^3)$ [5.7]
9. $\frac{3t^3s^{-1}}{12t^{-5}s}$ [5.2]
10. $\left(\frac{-2x^2y}{3z^4}\right)^3$ [5.1]
11. Evaluate $-x$ for $x = -8$. [1.6]
12. Evaluate $-(-x)$ for $x = -8$. [1.6]
13. Determine the leading term of the polynomial $4x^3 - 6x^2 - x^4 + 7$. [5.3]
14. Divide: $(8x^4 - 20x^3 + 2x^2 - 4x) \div (4x)$. [5.8]

Multiply.

15. $-4t^8(t^3 - 2t - 5)$ [5.5]
16. $(3x - 5)^2$ [5.6]
17. $(10x^5 + y)(10x^5 - y)$ [5.7]
18. $(x - 1)(x^2 - x - 1)$ [5.5]

Factor completely.

19. $c^2 - 1$ [6.4]
20. $5x + 5y + 10x^2 + 10xy$ [6.1]
21. $4r^2 - 4rt + t^2$ [6.4]
22. $6x^2 - 19x + 10$ [6.3]
23. $10y^2 + 40$ [6.1]
24. $x^2y - 3xy + 2y$ [6.2]
25. $12x^2 - 5xy - 2y^2$ [6.3]
26. $125a^3 + 64b^3$ [6.5]

Solve.

27. $\frac{1}{3} + 2x = \frac{1}{2}$ [2.2]
28. $3(t - 1) = 2 - (t + 1)$ [2.2]
29. $8y - 6(y - 2) = 3(2y + 7)$ [2.2]
30. $3x - 7 \geq 4 - 8x$ [2.6]
31. $(x - 1)(x + 3) = 0$ [6.7]
32. $x^2 + x = 12$ [6.7]
33. $3x^2 = 12$ [6.7]
34. $3x^2 = 12x$ [6.7]
35. Solve $a = bc + dc$ for c. [2.3]
36. Find the slope of the line containing the points $(6, 7)$ and $(-2, 7)$. [3.5]
37. Find the slope and the y-intercept of the line given by $2x + y = 5$. [3.6]
38. Write the slope–intercept equation for the line with slope 5 and y-intercept $\left(0, -\frac{1}{3}\right)$. [3.6]
39. Write the slope–intercept equation for the line with slope 5 that contains the point $\left(-\frac{1}{3}, 0\right)$. [3.7]

Graph.

40. $4(x + 1) = 8$ [3.3]
41. $x + y = 5$ [3.3]
42. $y = \frac{3}{2}x - 2$ [3.6]
43. $3x + 5y = 10$ [3.6]
44. Use a grid 10 squares wide and 10 squares high to plot $(5, 40)$, $(18, -60)$, and $(30, -22)$. Choose the scale carefully. [3.1]

Solve.

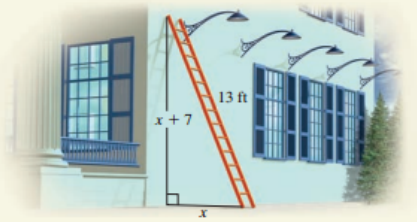
45. On average, men talk 97 min more per month on cell phones than do women. The sum of men's average minutes and women's average minutes is 647 min. What is the average number of minutes per month that men talk on cell phones? [2.5]
Source: *International Communications Research for Cingular Wireless*

46. The number of cell-phone subscribers increased from 680,000 in 1986 to 233,000,000 in 2006. What was the average rate of increase? [3.4]
Source: CTIA – The Wireless Association

47. In 2007, there were 1.2 billion Internet users worldwide. Of these, 5% spoke French. How many Internet users spoke French? [2.4]
Source: Internetworldstats.com

48. The number of people in the United States, in thousands, who are on a waiting list for an organ transplant can be approximated by the polynomial $2.38t + 77.38$, where t is the number of years since 2000. Estimate the number of people on a waiting list for an organ transplant in 2010. [5.3]
Source: Based on information from The Organ Procurement and Transplantation Network

49. A 13-ft ladder is placed against a building in such a way that the distance from the top of the ladder to the ground is 7 ft more than the distance from the bottom of the ladder to the building. Find both distances. [6.8]



50. A rectangular table in Arlo's House of Tunes is six times as long as it is wide. If the area of the table is 24 ft^2, find the length and the width of the table. [6.8]

51. Donna's quiz grades are 8, 3, 5, and 10. What scores on the fifth quiz will make her average quiz grade at least 7? [2.7]

52. The average amount of sodium in a serving of Chef Boyardee foods dropped from 1100 mg in 2003 to 900 mg in 2007. [3.7]
Source: *The Indianapolis Star*, 11/25/07
   a) Graph the data and determine an equation for the related line. Let s represent the average amount of sodium per serving and t the number of years after 2000.
   b) Use the equation of part (a) to estimate the average amount of sodium in a serving of Chef Boyardee foods in 2006.

Synthesis

Skip the synthesis problems

ANSWERS – Cumulative Review Chapters 1 to 3 and 5 to 6

Cumulative Review: Chapters 1–3, 5–6
pp. 430–431

1. $\frac{1}{2}$ **2.** $\frac{9}{32}$ **3.** $\frac{9}{8}$ **4.** 29 **5.** $\frac{1}{9x^4y^6}$ **6.** t^{10}

7. $3x^4 + 5x^3 + x - 10$ **8.** $-3a^2b - ab^2 + 2b^3$

9. $\frac{t^8}{4s^2}$ **10.** $-\frac{8x^6y^3}{27z^{12}}$ **11.** 8 **12.** -8 **13.** $-x^4$

14. $2x^3 - 5x^2 + \frac{1}{2}x - 1$ **15.** $-4t^{11} + 8t^9 + 20t^8$

16. $9x^2 - 30x + 25$ **17.** $100x^{10} - y^2$

18. $x^3 - 2x^2 + 1$ **19.** $(c + 1)(c - 1)$

20. $5(x + y)(1 + 2x)$ **21.** $(2r - t)^2$

22. $(2x - 5)(3x - 2)$ **23.** $10(y^2 + 4)$

24. $y(x - 1)(x - 2)$ **25.** $(3x - 2y)(4x + y)$

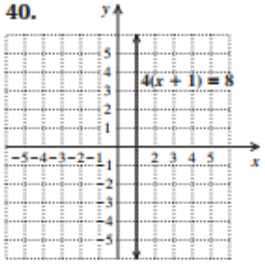
26. $(5a + 4b)(25a^2 - 20ab + 16b^2)$ **27.** $\frac{1}{12}$

28. 1 **29.** $-\frac{9}{4}$ **30.** $\{x|x \geq 1\}$, or $[1, \infty)$ **31.** $-3, 1$

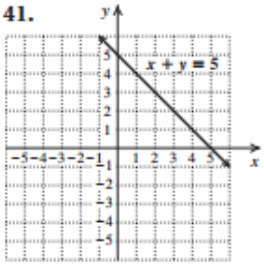
32. $-4, 3$ **33.** $-2, 2$ **34.** $0, 4$ **35.** $c = \frac{a}{b + d}$ **36.** 0

37. -2; $(0, 5)$ **38.** $y = 5x - \frac{1}{3}$ **39.** $y = 5x + \frac{5}{3}$

40.



41.



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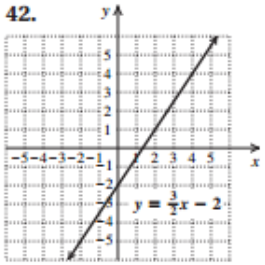
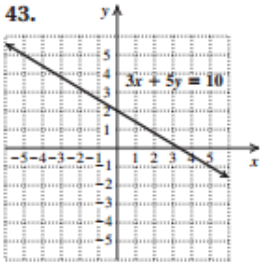


43.



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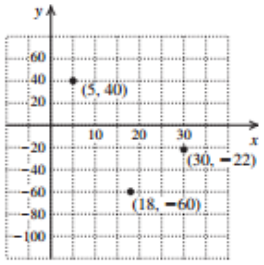


45. 372 min

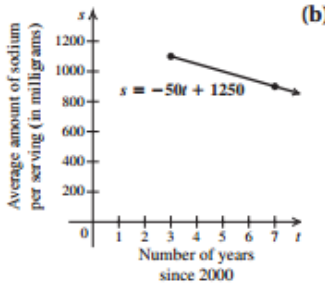
46. 11,616,000 subscribers per year **47.** 60,000,000 users **48.** 101,180 people

49. Bottom of ladder to building: 5 ft; top of ladder to ground: 12 ft

50. Length: 12 ft; width: 2 ft

51. Scores that are 9 and higher

52. (a)



(b) 950 mg per serving

53. $b = \frac{2}{a + 1}$ **54.** $y = -8$

55. (a) $9y^2 + 12y + 4 - x^2$; **(b)** $(3y + 2 + x)(3y + 2 - x)$

56. $-1, 0, \frac{1}{3}$