Ch. 1.1-1.7 Review

1. An expression is given. Evaluate it at the given value
$-x^4+x^3+8x,\quad x=-1$
(a) –10 (b) 9 (c) 9 (d) 10 (e) –12

2. Simplify the expression. $\dfrac{x-2}{x^2-4}$
(a) x + 2 (b) $\dfrac{1}{x+2}$ (c) $\dfrac{1}{x-2}$
(d) $\dfrac{1}{x+4}$ (e) $\dfrac{1}{x-4}$

3. Simplify the expression. $\dfrac{x^3+7x^2+10x}{x^2+8x+15}$
(a) $\dfrac{x+2}{x+3}$ (b) $\dfrac{x(x+2)}{x+3}$ (c) $\dfrac{x+2}{x(x+3)}$
(d) $x(x+2)$ (e) $\dfrac{x(x+3)}{x+2}$

4. Simplify the expression. $\dfrac{2y^2-5y-7}{4y^2-49}\div\dfrac{y^2-6y-7}{2y^2-7y-49}$
(a) 1 (b) $\dfrac{1}{y-1}$ (c) $\dfrac{1}{2y-7}$
(d) $\dfrac{1}{y-7}$ (e) 2y – 1

5. Simplify the expression. $\dfrac{x}{x^2-6x-27}-\dfrac{4}{x+3}-\dfrac{6}{x-9}$
(a) $\dfrac{18+9x}{(x-3)(x+9)}$ (b) $\dfrac{18-9x^2}{(x+3)(x-9)}$
(c) $\dfrac{18-9x}{(x+3)(x-9)}$ (d) $\dfrac{18-9x}{(x-3)(x+9)}$
(e) $\dfrac{18-9x}{x-9}$

6. Simplify the expression. $\dfrac{1}{x+3}-\dfrac{1}{(x+3)^2}+\dfrac{9}{x^2-9}$
(a) $\dfrac{x^2+8x+21}{(x+3)^2(x-3)^2}$ (b) $\dfrac{x^2+8x+21}{(x+3)^2+(x-3)}$
(c) $\dfrac{x^2+8x+21}{(x+3)^2(x-3)}$ (d) $\dfrac{x^2+8x+21}{(x+3)(x-3)^2}$
(e) $\dfrac{x^2-8x-21}{(x+3)^2(x-3)}$

7. Factor: $7x^2-7x-42$

8. Factor: $-x^2-4x+77$

9. Factor: $7x^2+31x-20$

10. Simplify the expression. $\dfrac{n^{-1}+m^{-1}}{(n+m)^{-7}}$
(a) $\dfrac{(n-m)^8}{n+m}$ (b) $\dfrac{(n+m)^8}{n+m}$ (c) $\dfrac{(n+m)^7}{nm}$
(d) $\dfrac{(nm)^8}{n+m}$ (e) $\dfrac{(n+m)^8}{nm}$

11. Simplify the expression. $\sqrt{1+\left(\dfrac{x}{\sqrt{9-x^2}}\right)^2}$
(a) $\dfrac{3}{9-x^2}$ (b) $\dfrac{3}{\sqrt[3]{9-x^2}}$ (c) $\dfrac{3}{\sqrt[4]{9-x^2}}$
(d) $\dfrac{3}{\sqrt{9-x^2}}$ (e) $\dfrac{1}{9-x^2}$

12. Determine whether the given value is a solution of the equation.
$\dfrac{1}{x}-\dfrac{1}{x-8}=\dfrac{1}{2},\ x=4$
(a) yes (b) no

13. Solve the equation. $-4w+32=-8w$
(a) 8 (b) 32 (c) 9 (d) –8 (e) –9

15. Solve the equation. $\dfrac{z}{9}=\dfrac{6}{63}z+7$
(a) –49 (b) 7 (c) 6 (d) 63 (e) 441

16. Solve the equation. $x-\dfrac{1}{12}x-\dfrac{1}{2}x-\dfrac{80}{24}=0$
(a) 8 (b) 6 (c) –6 (d) –8 (e) 9

17. Solve the equation. $\dfrac{4}{x-6}+\dfrac{12}{x+6}=\dfrac{144}{x^2-36}$
(a) 6 (b) 4 (c) –6 (d) 36 (e) 12

18. Solve the equation. $(t-5)^2=(t+5)^2+160$
(a) –5 (b) 5 (c) –8 (d) 8 (e) –32

19. Find all real solutions of the equation. $2x^2+7x-4=0$
(a) none of these (b) $x=-\dfrac{1}{2},\ 4$
(c) $x=\dfrac{3}{2},\ -1$ (d) $x=\dfrac{1}{2},\ -4$ (e) $x=-\dfrac{1}{2},\ -4$

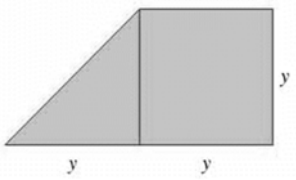
20. Find all real solutions of the equation. $\sqrt{4x+16}+4=x$
(a) 4, 0 (b) 0 (c) –12 (d) 0, 12 (e) 12

21. Find all real solutions of the equation. $\sqrt{\sqrt{x+2}+x}=2$
(a) x = 6 (b) x = –7, x = 2 (c) x = 7, x = 2
(d) x = –14, x = –5 (e) x = 2

22. Perform the addition and simplify. $\dfrac{1}{x+5}+\dfrac{1}{x^2-25}$

23. Perform the subtraction and simplify.
$\dfrac{x}{x^2-x-20}-\dfrac{1}{x+4}-\dfrac{3}{x-5}$

24. Find the length y in the figure, if the shaded area is 96 in^2.



25. Perform the multiplication and simplify.
$\dfrac{x^2-3x-40}{x^2-25}\cdot\dfrac{5+x}{8-x}$

26. Perform the addition and simplify. $\dfrac{1}{x+5}+\dfrac{1}{x^2-25}$

27. Perform the subtraction and simplify.

$$\frac{x}{x^2-x-20}-\frac{1}{x+4}-\frac{3}{x-5}$$

28. Determine whether the given value is a solution of the equation.

$$\frac{x^{5/2}}{x-6}=x-20$$

(a) x = 8 (b) x = 4

29. The given equation is either linear or equivalent to a linear equation. Solve the equation. $4t-10=18-4t$

30. Solve the equation by factoring. $2y^2+5y+2=0$

31. Solve the equation by completing the square.

$$x^2=\frac{3}{5}x-\frac{2}{25}$$

32. Find all real solutions of the equation. $|3x|=7$

33. Simplify $(5ab)^4$

34. Simplify $\left(\frac{20t^3}{10s^4}\right)^2$

35. Simplify: $\left(6x^7-8x^6-12\right)-\left(3x^7+6x^6+2\right)$

36. Simplify:
$\left(1.3x^3+7.2x^2+4.8\right)+\left(6.3x-2.6\right)-\left(3.1x^2-x-9.4\right)$

37. Multiply: $(2y-1)(3y+10)$

38. Multiply: $(x-5)\left(x^2+5x+25\right)$

39. Factor: $120m^9-24m^7+60m^2$

40. Factor: $x(y+11)+9(y+11)$

41. Factor: $10y^2-23y+12$

42. Factor: x^4-625

43. Factor: $x^2-\frac{1}{16}$

44. 29. Multiply: $5y^2\left(5y^2+2y-3\right)$

45. Simplify each radical and combine if possible:
$2\sqrt{8}-4\sqrt{72}$

46. Simplify each radical and combine if possible:
$\sqrt{20}+\sqrt{405}$

47. Simplify each radical and combine if possible:
$\sqrt{75xy^6}\cdot\sqrt{3x^2y^6}$

48. Rationalize and simplify: $\frac{3}{\sqrt{2}}$

49. Rationalize and simplify: $\sqrt{\frac{10}{x}}$

50. Simplify: $125^{2/3}$

51. Simplify: $\left(\frac{8}{27}\right)^{2/3}$

52. Simplify: $9^{-3/2}$

53. Perform the multiplication and simplify.

$$\frac{x^2-3x-40}{x^2-25}\cdot\frac{5+x}{8-x}$$

54. Solve the linear inequality. Express the solution using interval notation. $3(5x-2)\le 12x+27$

A $(-\infty,13]$ B $(-\infty,11]$ C $(-\infty,10]$
D $(-\infty,14]$ E $(-\infty,12]$

55. Solve the nonlinear inequality. Express the solution using interval notation. $x^2-2x-24\le 0$

A $(-\infty,-5)[8,\infty)$ B $(-\infty,-5][8,\infty)$
C $[-5,8]$ D $[-4,6]$ E $(-\infty,-6)[4,\infty)$

56. Solve the nonlinear inequality. Express the solution using interval notation. $\frac{3x+1}{x-4}\le 4$

A $(-\infty,4)[19,\infty)$ B $(-\infty,4)[18,\infty)$
C $(-\infty,4)[17,\infty)$ D $(-\infty,4)[15,\infty)$
E $(-\infty,4)[16,\infty)$

57. A riverboat theater offers bus tours to groups on the following basis. Hiring the bus costs the group $300, to be shared equally by the group members. Theater tickets, normally $30 each, are discounted by 25 cents times the number of people in the group. How many members must be in the group so that the cost of the theater tour (bus fare plus theater ticket) is less than $40 per person?

A at least 16 members B at least 21 members
C at least 12 members D at least 20 members
E at least 32 members

58. Solve the inequality. Express the solution using interval notation. $0<11-5x$

A $\left[\frac{14}{5},\infty\right)$ B $\left(\frac{14}{5},\infty\right)$ C $\left(-\infty,\frac{11}{5}\right]$
D $\left(-\infty,\frac{14}{5}\right)$ E $\left(-\infty,\frac{11}{5}\right)$

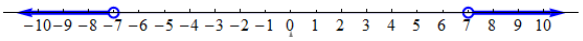
59. Solve the inequality. Express the solution using interval notation. $3\le x+9<6$

A [–8, –6) B [2, 7) C [3, 6)
D [–6, –3) E [–7, –2)

60. Solve the inequality. Express the answer using interval notation. $|x+9|\ge 6$

A $\varnothing$ B [–15, –3] C $[-3,\infty)$
D $(-\infty,-15][-3,\infty)$ E $(-\infty,-15)(-3,\infty)$

61. A set of real numbers is graphed. Find an inequality involving an absolute value that describes the set.



A $|x|>7$ B $|x-6|<7$ C $|x|\ge 7$
D $|x|\le 7$ E $|x|<7$

62. Solve the nonlinear inequality. Express the solution using interval notation and graph the solution set. $\frac{x}{x+1}>3x$

A $(-\infty,-1)(0,\infty)$ B $(-\infty,-1)\left(-\frac{2}{3},0\right)$
C $(-\infty,-1)\left(-\frac{2}{3},\infty\right)$ D $(-1,0)\left(\frac{2}{3},\infty\right)$

Answer Section

1. A
2. B
3. B
4. A
5. C
6. C
7. $7(x+2)(x-3)$
8. $-(x+11)(x-7)$
9. $(7x-4)(x+5)$
10. E
11. D
12. A
13. D
15. E
16. A
17. E
18. C
19. D
20. E
21. E
22. $\frac{x-4}{(x-5)(x+5)}$
23. $\frac{-3x-7}{(x-5)(x+4)}$
24. 8 in.
25. $\frac{5+x}{5-x}$
26. $\frac{x-4}{(x-5)(x+5)}$
27. $\frac{-3x-7}{(x-5)(x+4)}$
28. $x = 8$ is not a solution; $x = 4$ is a solution
29. $t = \frac{7}{2}$
30. $y = -2,\ y = -\frac{1}{2}$
31. $x = \frac{2}{5},\ x = \frac{1}{5}$
32. $x = -\frac{7}{3},\ x = \frac{7}{3}$
33. $625a^4b^4$
34. $\frac{4t^6}{s^8}$
35. $3x^7 - 14x^6 - 14$
36. $1.3x^3 + 4.1x^2 + 7.3x + 11.6$
37. $6y^2 + 17y - 10$
38. $x^3 - 125$
39. $12m^2\left(10m^7 - 2m^5 + 5\right)$
40. $(y+11)(x+9)$
41. $(2y-3)(5y-4)$
42. $\left(x^2+25\right)(x-5)(x+5)$
43. $\left(x-\frac{1}{4}\right)\left(x+\frac{1}{4}\right)$
44. $25y^4 + 10y^3 - 15y^2$
45. $-20\sqrt{2}$
46. $11\sqrt{5}$
47. $15xy^6\sqrt{x}$
48. $\frac{3\sqrt{2}}{2}$
49. $\frac{\sqrt{10x}}{x}$
50. 25
51. $\frac{4}{9}$
52. $\frac{1}{27}$
53. $\frac{5+x}{5-x}$
54. B
55. D
56. C
57. B
58. E
59. D
60. D
61. A
62. B