CH 2 SIMPLIFICATION

ANSWERS AND EXPLANATIONS

EXERCISE 1

1. (e) $? = \frac{11 \times 55}{5} + 9$

$= 121 + 9 = 130$

2. (a) $? = 85333 - 11638 - 60994$

$? = 85333 - 72632$

$\therefore ? = 12701$

3. (c) $? = 8^4 - 8^2$

$= 8^2 (8^2 - 1) = 64 (64 - 1)$

$= 64 \times 63 = 4032$

4. (c) $? = 6.3 \times 12.8 \times 9.9 - 69.996$

$= 798.336 - 69.996 = 728.34$

5. (d) $? = 8 + \left(\frac{18 \times 368}{16}\right)$

$= 8 + 414 = 422$

6. (a) $24848 = 107604$

$\Rightarrow ? = 107604 + 24848 = 132452$

7. (b) $? = 894.65 + 100.99 - 388.24$

$995.64 - 388.24 = 607.4$

8. (d) $(?)^2 + (26)^2 = 1181 + 1520$

$\Rightarrow ?^2 + 676 = 2701$

$\Rightarrow ?^2 = 2701 - 676 = 2025$

$\Rightarrow ? = \sqrt{2025} = 45$

9. (e) $\frac{59475}{\sqrt{?}} = 195 \times 5$

$\Rightarrow \sqrt{?} = \frac{59475}{195 \times 5} = 61$

$\Rightarrow 61 \times 61 = 3721$

10. (b) $\sqrt{?} + 29 = \sqrt{2704}$

$\Rightarrow \sqrt{?} + 29 = 52$

$\Rightarrow \sqrt{?} = 52 - 29 = 23$

$\therefore ? = 23 \times 23 = 529$

11. (c) $(7)^{1/4} \times (343)^{0.25} = (7)^{1/4} \times (7^3)^{1/4} = (7^4)^{1/4} = 7$

12. (a) $57.63 - 37.26 = 39.27 - ?$

$\Rightarrow 20.37 = 39.27 - ?$

$\Rightarrow ? = 39.27 - 20.37 = 18.9$

13. (e) $\sqrt{?} = \sqrt{1089} + \sqrt{289}$

$= 33 + 17 = 50$

$? = (50)^2 = 2500$

14. (c) $? = 12.8 \times 2.5 + 8.6$

$= 32 + 8.6 = 40.6$

15. (b) $?^2 = (14^2 - 13^2) \div 3$

$= (14 + 13)(14 - 13) \div 3$

$= 27 \times \frac{1}{3} = 9$

$\therefore ? = \sqrt{9} = 3$

16. (e) $(19)^? = \frac{(19)^{12} \times (19)^8}{(19)^4}$

or $(19)^? = \frac{(19)^{20}}{(19)^4}$

or $(19)^? = (19)^{20-4} = (19)^{16}$

or $? = 16$

17. (b) $? = \frac{70.56}{11.2} = 6.3$

18. (a) $? = 986.23 + 7.952 + 8176.158 = 9170.340$

19. (c) $? = \sqrt{1296} \div \sqrt{36}$

$= 36 \div 6 = 6$

20. (c) $112 \div 7 \div 4 = 8 \times ?$

$\Rightarrow 8 \times ? = \frac{112}{7 \times 4}$

$\Rightarrow ? = \frac{4}{8} = \frac{1}{2} = 0.5$

21. (a) $? = 3750 \times \frac{4}{8} \times \frac{2}{3} \times \frac{1}{2} = 625$

22. (e) $? = \frac{24+4}{135-9} = \frac{28}{126} = \frac{2}{9}$

23. (b) $? = (87324 - 79576) \times 1.5$

$= 7748 \times 1.5 = 11622$

24. (a) $? = 350 \times 4 \times 50 = 70000$

25. (e) $? = 11.88 \times \frac{250}{18} = 165$

26. (e) $? = \frac{1}{2} \times \frac{3}{4} \div \left(\frac{9}{2} \times \frac{5}{8}\right)$

$= \frac{1}{2} \times \frac{3}{4} \div \frac{45}{16}$

$= \frac{1}{2} \times \frac{3}{4} \times \frac{16}{45} = \frac{2}{15}$

27. (d) $? = \frac{18+17\times3-1}{8-15\div3-1}$

$= \frac{18+51-1}{8-5-1} = \frac{68}{2} = 34$

28. (a) $? = \frac{3}{2} + \frac{5}{3} \div \left(\frac{6}{7} - \frac{5}{6}\right)$

$= \frac{3}{2} + \frac{5}{3} \div \left(\frac{36-35}{42}\right)$

$= \frac{3}{2} + \frac{5}{3} \div \frac{1}{42} = \frac{3}{2} + \frac{5}{3} \times 42$

$= \frac{3}{2} + 70 = \frac{3+140}{2} = \frac{143}{2}$

$= 71.5$

29. (e) $\sqrt{?} - 63 = 9^2$

$\Rightarrow \sqrt{?} = 81 + 63 = 144$

$\Rightarrow ? = (144)^2 = 20736$

30. (e) $916.28 - 72.4 = 728.2 + ?$

$\Rightarrow 843.88 = 728.2 + ?$

$\Rightarrow ? = 843.88 - 728.2 = 115.68$

31. (c) $? = 7776 \times \frac{1}{18} \times 3 = 1296$

32. (e) $? = 8994 - 4178 - 2094$

$= 8994 - 6272 = 2722$

33. (c) $? = 315 \times 114 - 1565$

$= 35910 - 1565 = 34345$

34. (d) $? = 1256 \div (32 \times 0.25)$

$= 1256 \div 8 = 157$

35. (a) $? = 69.2 \times 18.4 \times 4.5 = 5729.76$

36. (e) $? = 3.2 \times 6.8 \times 9.5 = 206.72$

37. (c) $? = 15^3 \times 9^3 - (1555)^2$

$= 3375 \times 729 - 2418025 = 42350$

38. (a) $? = 8\frac{2}{5} \div 10\frac{2}{25}$

$= \frac{42}{5} \div \frac{252}{25}$

$= \frac{42}{5} \times \frac{25}{252} = \frac{5}{6}$

39. (c) $? = 992 \times \frac{5}{6} \times \frac{3}{4} \times \frac{3}{5} = 372$

40. (d) $\sqrt{?} + 17 = \sqrt{961}$

or $\sqrt{?} + 17 = 31$

or $\sqrt{?} = 31 - 17$

or $\sqrt{?} = 14$

or $? = 14 \times 14 = 196$

41. (a) $? = \frac{123}{6 \times 0.8} = 25.625$

42. (b) $? = [(4)^3 \times (5)^4] \div (4)^5$

$= \frac{4^3 \times 5^4}{4^5} = \frac{5^4}{4^2}$

$= \frac{5 \times 5 \times 5 \times 5}{4 \times 4} = 39.0625$

43. (c) $? = \frac{1.6 \times 3.2}{0.08} = 64$

44. (b) $? = \frac{7857 + 3596 + 4123}{96}$

$= \frac{15576}{96} = 162.25$

45. (d) $\frac{(84)^2}{\sqrt{?}} = 168$

$\sqrt{?} = \frac{84 \times 84}{168} = 42$

$\Rightarrow ? = (42)^2 = 1764$

46. (e) $? = \sqrt[3]{50623} = \sqrt[3]{(37)^3} = 37$

47. (a) $? = \frac{93336}{17891 + 16239 - 26352} = \frac{93336}{7778} = 12$

48. (a) $? = \frac{1}{4} \times 6624 \times \frac{1}{6} \times 12 = 3312$

49. (e) $? = \frac{18 \times 15 - 50}{(40 \times 80) \div 160} = \frac{220}{20} = 11$

50. (e) $\sqrt{?} = \frac{2296}{\sqrt{1681}} = \frac{2296}{41} = 56$

$? = (56)^2 = 3136$

51. (a) $? = 93 \times 45 \div 25$

$= \frac{93 \times 45}{25} = 167.4$

52. (d) $? = \frac{0.2944}{0.08 \times 1.6} = 2.3$

53. (a) $? = 6 \times 66 \times 666 = 263736$

54. (c) $? = \frac{36}{7} \times \frac{49}{6} \times \frac{8}{63}$

$= \frac{16}{3} = 5\frac{1}{3}$

55. (e) $\frac{(7)^3}{\sqrt{?}} = 14 - 7 = 7$

$\Rightarrow \sqrt{?} = \frac{7^3}{7} = 49$

$\Rightarrow ? = 49^2 = 2401$

56. (e) $? = \frac{1035}{\sqrt[3]{12167}} = \frac{1035}{23} = 45$

57. (b) $? = 1256 \times 3892 = 4888352$

58. (b) $? = 0.08 \times 0.5 + 0.9$

$= 0.04 + 0.9 = 0.94$

59. (d) $? \times 12 = 7847 - \frac{8195}{745}$

$\Rightarrow ? \times 12 = 7847 - 11 = 7836$

$\Rightarrow ? = 653$

60. (a) $666 \div (2.4 \times ?) = 185$

or $\frac{666}{2.4 \times ?} = 185$

or $? = \frac{666}{2.4 \times 185} = 1.5$

61. (d) $\frac{3}{8} \times \frac{4}{7} \times ? = 5376$

or $? \times \frac{3}{14} = 5376$

or $? = \frac{5376 \times 14}{3} = 25088$

62. (e) $[9^3 \times (?)^2] \div 21 = 1701$

or $\frac{9^3 \times (?)^2}{21} = 1701$

or $?^2 = \frac{1701 \times 21}{9 \times 9 \times 9} = 49$

$\therefore ? = \sqrt{49} = 7$

63. (c) $? = 897214 - (336 + 46521 + 1249 + 632176)$

$= 897214 - 680282 = 216932$

64. (a) $\sqrt{11881} \times \sqrt{?} = 10137$

or $109 \times \sqrt{?} = 10137$

or $\sqrt{?} = \frac{10137}{109} = 93$

or $? = 93 \times 93 = 8649$

65. (e) $3.5 \times 2.4 \times ? = 42$

or $? = \frac{42}{3.5 \times 2.4} = 5$

66. (d) $? = \sqrt[3]{804357}$

$= \sqrt[3]{93 \times 93 \times 93}$

[from given options]

$= 93$

67. (c) $\sqrt{?} \div 16 \times 24 = 186$

or $? = \frac{\sqrt{?}}{16} \times 24 = 186$

or $\sqrt{?} = \frac{186 \times 16}{24} = 124$

$\therefore ? = 124 \times 124 = 15376$

68. (e) $\frac{?^2}{(0.04)^2} \times 5.6 = 117740$

or $(?)^2 = \frac{117740 \times 0.04 \times 0.04}{5.6} = 33.64$

or $? = \sqrt{33.64} = 5.8$

69. (b) $9418 - ? + 1436 + 2156 = 5658$

or $13010 - ? = 5658$

or $? = 13010 - 5658 = 7352$

70. (c) $9865 + ? + 3174 + 2257 = 19425$

or $? + 15296 = 19425$

or $? = 19425 - 15296 = 4129$

71. (b) $\frac{9}{?} \times 33824 = 63$

or $? = \frac{9 \times 33824}{63} = 4832$

72. (b) $(99)^2 - (?)^2 + (38)^2 = 8436$

or $9801 - (?)^2 + 1444 = 8436$

or $11245 - (?)^2 = 8436$

or $(?)^2 = 11245 - 8436 = 2809$

or $? = \sqrt{2809} = 53$

73. (d) $? = 12.36 \times 18.15 + 21.52$

$= 224.334 + 21.52$

$= 245.854$

74. (a) $(98764 + 89881 + 99763 + 66342) \div$

$(1186 + ? + 1040 + 1870) = 55$

or $354750 \div (? + 4096) = 55$

or $\frac{354750}{?+4096} = 55$

or $? + 4096 = \frac{354750}{55}$

or $? = 4096 = 6450$

or $? = 6450 - 4096 = 2354$

75. (a) $? = (64)^2 \div \sqrt[3]{32 \times 32 \times 32}$

or $? = \frac{64 \times 64}{32} = 128$

76. (e) $? = \frac{21 \times 14 - 34}{12.4 + 5.6 - 15.5}$

$= \frac{294 - 34}{18 - 15.5} = \frac{260}{2.5} = 104$

77. (c) $0.09 \times 6.8 \times ? = 2.142$