

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) $?$ = $986.23 + 7.952 + 8176.158 = 9170.340$



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

$$= 36 \div 6 = 6$$

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

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

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

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

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

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

$$= 7748 \times 1.5 = 11622$$

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

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

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

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

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

$$27. (d) ? = \frac{18+17 \times 3-1}{8-15 \div 3-1}$$

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

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

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

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

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

$$= 71.5$$

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

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

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

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

$$\Rightarrow 843.88 = 728.2 + ?$$

$$\Rightarrow ? = 843.88 - 728.2 = 115.68$$

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

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

$$= 8994 - 6272 = 2722$$

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

$$= 35910 - 1565 = 34345$$

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

$$= 1256 \div 8 = 157$$

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

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

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

$$= 3375 \times 729 - 2418025 = 42350$$

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

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

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

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

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

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

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

$$\text{or } \sqrt{?} = 14$$

$$\text{or } ? = 14 \times 14 = 196$$

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$? = (56)^2 = 3136$$

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

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

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

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

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

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

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

$$\Rightarrow \sqrt{?} = \frac{7^2}{7} = 49$$

$$\Rightarrow ? = 49^2 = 2401$$

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

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

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

$$= 0.04 + 0.9 = 0.94$$

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

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

$$\Rightarrow ? = 653$$

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

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

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

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

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

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

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

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



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

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

$$63. \text{ (c) } ? = 897214 - (336 + 46521 + 1249 + 632176) \\ = 897214 - 680282 = 216932$$

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

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

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

$$\text{or } ? = 93 \times 93 = 8649$$

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

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

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

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

[from given options]

$$= 93$$

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

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

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

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

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

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

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

$$69. \text{ (b) } 9418 - ? + 1436 + 2156 = 5658$$

$$\text{or } 13010 - ? = 5658$$

$$\text{or } ? = 13010 - 5658 = 7352$$

$$70. \text{ (c) } 9865 + ? + 3174 + 2257 = 19425$$

$$\text{or } ? + 15296 = 19425$$

$$\text{or } ? = 19425 - 15296 = 4129$$

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

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

$$72. \text{ (b) } (99)^2 - (?)^2 + (38)^2 = 8436$$

$$\text{or } 9801 - (?)^2 + 1444 = 8436$$

$$\text{or } 11245 - (?)^2 = 8436$$

$$\text{or } (?)^2 = 11245 - 8436 = 2809$$

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

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

$$= 224.334 + 21.52$$

$$= 245.854$$

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

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

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

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

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

$$\text{or } ? = 4096 = 6450$$

$$\text{or } ? = 6450 - 4096 = 2354$$

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

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

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

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

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

