

Answers

Build-up Exercise 2A (page 2.19)

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|---------------------------------|----------------------------------|
| 1. $0, \frac{3}{2}$ | 2. $-\frac{5}{3}, 0$ |
| 3. $-3, 3$ | 4. $4, -2$ |
| 5. $-\frac{4}{3}, \frac{7}{2}$ | 6. $-\frac{9}{4}, \frac{8}{5}$ |
| 7. -8 | 8. $\frac{2}{5}$ |
| 9. $0, 4$ | 10. $0, 5$ |
| 11. $-3, -9$ | 12. -6 |
| 13. $5, 8$ | 14. $9, 10$ |
| 15. $6, -7$ | 16. $7, -12$ |
| 17. $13, -7$ | 18. $15, -5$ |
| 19. $\frac{5}{2}, -\frac{2}{3}$ | 20. $-\frac{3}{4}, -\frac{7}{3}$ |
| 21. $\frac{5}{6}, \frac{2}{5}$ | 22. $-\frac{1}{4}, -2$ |
| 23. $\frac{1}{7}, -\frac{3}{5}$ | 24. $4, -4$ |
| 25. $2, -8$ | 26. $\frac{9}{5}, -\frac{7}{4}$ |
| 27. $-\frac{5}{3}, -6$ | 28. $3, -6$ |
| 29. $3, -\frac{7}{3}$ | 30. $2, \frac{1}{2}$ |
| 31. $-6, -10$ | 32. $1, 3$ |
| 33. $0, -6$ | 34. $\frac{5}{2}$ |
| 35. $\frac{1}{3}, -\frac{2}{3}$ | 36. $-\frac{3}{8}, -2$ |
| 37. $p-4, p+4$ | |

Build-up Exercise 2B (page 2.20)

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|--------------------------------|--------------------------------|
| 38. $14, -4$ | 39. $-1, -13$ |
| 40. $2, -\frac{10}{3}$ | 41. $2+\sqrt{2}, 2-\sqrt{2}$ |
| 42. $-5, -12$ | 43. 7 |
| 44. $\frac{-9\pm\sqrt{13}}{2}$ | 45. No real roots |
| 46. $\frac{-3\pm\sqrt{41}}{4}$ | 47. $\frac{-9\pm\sqrt{33}}{8}$ |

48. $\frac{5\pm\sqrt{61}}{6}$

50. $8+2\sqrt{10}, 8-2\sqrt{10}$

52. $\frac{5}{2}+\sqrt{6}, \frac{5}{2}-\sqrt{6}$

54. $\frac{3\pm\sqrt{33}}{3}$

56. $\frac{5\pm 2\sqrt{15}}{5}$

58. $-1\pm\sqrt{5}$

60. $\frac{5\pm 3\sqrt{17}}{16}$

62. $-\frac{5}{4}\pm\frac{\sqrt{31}}{4}i$

64. $\frac{2\sqrt{10}}{5}i$

66. $-\frac{7}{12}\pm\frac{\sqrt{47}}{12}i$

68. (c) (i) $-2\pm 2\sqrt{3}$
(ii) $\frac{3}{2}\pm\frac{3}{2}i$

49. No real roots

51. $3\sqrt{2}-\frac{3}{2}, -3\sqrt{2}-\frac{3}{2}$

53. $\frac{3\sqrt{2}-3}{4}, \frac{-3\sqrt{2}-3}{4}$

55. $\frac{1\pm\sqrt{15}}{2}$

57. $\frac{3\pm\sqrt{29}}{4}$

59. $\frac{2\pm 3\sqrt{6}}{10}$

61. $\frac{4\pm\sqrt{10}}{3}$

63. $-\frac{2}{3}\pm\frac{2\sqrt{5}}{3}i$

65. $\frac{3}{8}\pm\frac{7\sqrt{15}}{40}i$

67. $-\frac{8}{3}\pm\frac{\sqrt{71}}{3}i$

Build-up Exercise 2C (page 2.22)

69. 10 cm
70. $\frac{5}{2}$ m
71. 15
72. 13
73. 4, -9
74. (a) $x+2$
(b) 17, 19
75. 169 cm^2
76. (a) $(25-\ell)\text{ cm}$
(b) Length = 11 cm, width = 14 cm;
length = 14 cm, width = 11 cm
77. 29 cm
78. 40 cm
79. 6, $-\frac{28}{5}$
80. (a) $(-\frac{x^2}{2}+\frac{9x}{2}+45)\text{ cm}^2$

(b) $\frac{9 \pm \sqrt{41}}{2}$

81. (a) 6

(b) $468\pi \text{ cm}^3$

82. (a) 1.5 m

(b) 0.7

83. (a) $(4x^2 - 30x + 54) \text{ m}^2$

(b) Length = 6 m, width = 3 m

84. (a) $(3x^2 - 45x + 162) \text{ cm}^3$

(b) $\frac{15 + \sqrt{509}}{2}$

85. (a) Father: $x + 35$, mother: $x + 28$

(b) 4

86. (a) $6 - x$

(b) $60 - 9x$

(c) 15, 24

Build-up Exercise 2D (page 2.26)

87. (a) 29

(b) 0

(c) -87

(d) -155

(e) 9

(f) -432

88. (a) Two unequal real roots

(b) No real roots

(c) No real roots

(d) Two equal real roots

(e) Two unequal real roots

(f) No real roots

89. (a) $4 - 4k$

(b) $64 + 8k$

(c) $9 - 20k$

(d) $4k^2 + 24$

90. (a) $256 + 48k$

(b) $k \geq -\frac{16}{3}$

91. (a) $144 - 16k$

(b) 9

92. (a) $576 - 120k$

(b) $k > \frac{24}{5}$

93. (a) 25

(b) $\frac{4}{3}$

94. (a) $k > -\frac{1}{8}$

(b) $k < \frac{1}{4}$ and $k \neq 0$

95. (a) $k > \frac{81}{8}$

(b) $k < -\frac{4}{5}$

96. (a) $-\frac{13}{2}$

(b) 4, 12

97. (a) $k > \frac{1}{10}$

(b) $k > 0$ and $k \neq \frac{1}{3}$

98. (a) $k < -11$

(b) $k < -\frac{1}{2}$

99. (a) $k \geq -\frac{17}{6}$

(b) $k \leq 2$ and $k \neq 1$

100. (a) 24

(b) $\frac{1}{6}$

101. (a) 1

(b) -1

102. (a) $k^2 + 4k + 4$

Build-up Exercise 2E (page 2.29)

104. $x^2 - 11x + 18 = 0$

105. $x^2 - 25 = 0$

106. $3x^2 + x = 0$

107. $16x^2 - 24x + 9 = 0$

108. $\alpha + \beta = 2$, $\alpha\beta = 4$

109. $\alpha + \beta = -3$, $\alpha\beta = -7$

110. $\alpha + \beta = \frac{5}{3}$, $\alpha\beta = -3$

111. $\alpha + \beta = \frac{1}{2}$, $\alpha\beta = -\frac{3}{4}$

112. $x^2 - 8x + 13 = 0$

113. (a) $\frac{5}{2}$

(b) 16

114. 3

115. (a) -2
(b) -48
116. (a) $\frac{2}{5}$
(b) $\frac{4}{5}$
117. (a) 59
(b) -448
118. (a) 13
(b) $\frac{25}{24}$
119. (a) $8x^2 + 6x + 63 = 0$
(b) $8x^2 - 30x + 35 = 0$
120. (a) $3x^2 - 3x + 2 = 0$
(b) $2x^2 + x + 2 = 0$
121. (a) $7x^2 + 10x + 27 = 0$
(b) $49x^2 + 80x + 36 = 0$
122. $\frac{1}{5}, 5$
123. 6
124. 72
125. (a) 3
(b) $x^2 + 45x - 8 = 0$
126. (a) -3
(b) $\frac{1}{2}, \frac{2}{5}$
127. (b) $2 \pm 2\sqrt{2}i$
128. (b) $k^2 - 3$
129. (a) $m + n = -\frac{1}{3}, mn = -1$
(b) $\frac{19}{9}$
(c) $9x^2 - 19x + 9 = 0$
130. (a) (i) $\frac{3}{8}$
(ii) $-\frac{1}{16}$
(b) $16x^2 + (32m - 6)x + 16m^2 - 6m - 1 = 0$