

Chapter 4 answers

4.1

1. $4(x-4)$ 3. $5x(7x-3)$ 5. $3a(2a+1)$ 7. $5x(3x-y+2)$ 9. $5x^3(9x^3-7x-15)$
11. $m^5n^3(m^2-n^3+m^2n^2)$ 13. $2x(x^3-x^2-1)$ 15. $3ab(2ab-3a+4b)$
17. $9x^4y^3(x^2-4y^2+5x^2y^2)$ 19. $7x^3(4x^4-5x-14)$ 21. $21y(3x^2+2x+1)$
23. $4pq^2(4pq-6p^2q+3)$ 25. $5x^3y(4x^4-3x-10)$ 27. $L^4W^3(2L^3-6W^2+3L^2W^3)$
29. $9x^5y^4z(x^2-3y^2+5x^3y^3)$ 31. $10xy(6x^3+3x^2+2x-10)$ 33. $a(b-c+d-a-1)$
35. $6x^5y^3(x^2-2y^3+5x^3y^3-1)$ 37. $(4x-5)(x-8)$ 39. $(3a+2)(6a^3+7)$
41. $(2x-3)(2x-9)$ 43. $(x-2)(4x^2-5)$ 45. $(2x+9)(8x-1)$ 47. $(4y-1)^2$
49. $4(3x+4)(x+2)$ 51. $x(x-2)(5y-3)$ 53. $xy(2x+3)(2x-1)$ 55. $(x-1)^2(3x+2)$
57. $(x+7)(7x^2+49x+4)$ 59. $(x+2)^3(x^2+2x+2)$

4.2

1. $(x+y)(a+b)$ 3. $(a+z)(y+b)$ 5. $(y+x)(y+a)$ 7. $(x+t)(x+a)$
9. $(x-4)(x-y)$ 11. $(a+b)(x-1)$ 13. $(x-a)(x-y)$ 15. $(c+d)(2-d)$
17. $(x-y)(x-4)$ 19. $(x-y)(7-y)$ 21. $(t^2+3x)(c-1)$ 23. $(x^2+2y)(x^2+2)$
25. $(m+3)(m-n)$ 27. $(x-2)(x^3+3)$ 29. $2(a-1)(a^2-x)$ 31. $2(x^2+y^2)(a-b)$
33. $x(x-a)(x-2)$ 35. $2x(x^2+5)(x-4)$ 37. $3x^2y(x^2+3)(x+3)$
39. $y^2(xz+t)(xz+y)$

4.3

1. $(x+3)(x-5)$ 3. $(a+9)(a-7)$ 5. Prime 7. $(y+3)(y+8)$
9. $(a-2)^2$ 11. $(c+3)(c-7)$ 13. $(b+9)(b-3)$ 15. $(x+4y)(x+9y)$
17. $(xy-3)(xy-1)$ 19. $(x-8)^2$ 21. $(x+7)(x-30)$ 23. Prime
25. Prime 27. $(nm+2)(nm-8)$ 29. $(x+3y)(x+5y)$ 31. $5(x-3)(x-4)$
33. $3(a-1)(a+4)$ 35. $x(x+10)^2$ 37. $-(x-15)(x+13)$ 39. $-y(x-4)(x+11)$
41. $xy(x+8)^2$ 43. $4b^2(a-2)(a+4)$ 45. $5b(a-6b)(a-7b)$
47. $-2a(x-4y)(x+12y)$ 49. $-3a^5(a-4)(a+12)$ 51. $3x^2(x-7)^2$
53. $5x^2(x+7y)(x+3y)$ 55. $7x^3(xy+11)(xy+3)$ 57. $2a^7b^3(a-8)(a+10)$
59. $5x^6yz(xy-9)(xy+11)$

4.4

1. $(3x+5)(x+1)$ 3. $(4x+1)(x+5)$ 5. $(5y-8)(y+5)$ 7. Prime
9. $(3x+7y)(4x-5y)$ 11. $(5xy+3)(2xy-1)$ 13. $(2a-1)(3a-2)$ 15. $(7x-1)(5x-7)$
17. $(3x-5)^2$ 19. Prime 21. $(4a-7b)(a+4b)$ 23. $(6nm+5)(2nm-7)$
25. $(4x-3)^2$ 27. $(7x+9)(8x+7)$ 29. $(5p+4q)(3p-2q)$ 31. $5(x-2)(3x+4)$
33. $8(x-5)^2$ 35. $-6(x-7)(3x+16)$ 37. $a(4b+5a)(5b+3a)$
39. $3x^2(3xy+5)(xy+1)$ 41. $-5y(x-3)(3x+4)$ 43. $2y^2(2x-5)^2$
45. $LW(4LW-3)(3LW-8)$ 47. $2b(2c+3)(8c-5)$ 49. $3xy(x-3y)(3x+4y)$
51. $2v(7u-1)(5u-7)$ 53. $13a(b-3)^2$ 55. $-2x(2xy-3)(3xy-2)$
57. $y(8x+3)(2x+9)$ 59. $5xz^2(4x-5z)^2$

4.5

1. $(x-2)(x+2)$ 3. $(x-y)(x^2+xy+y^2)$ 5. $(a+3)(a^2-3a+9)$ 7. Prime
9. $(y-1)(y^2+y+1)$ 11. $(b-4)(b+4)$ 13. $(x-2y)(x^2+2xy+4y^2)$
15. $(4c+3)(16c^2-12c+9)$ 17. $(x-9y)(x+9y)$ 19. $(2x-1)(2x+1)$
21. $(xy+z)(x^2y^2-xyz+z^2)$ 23. $(2a-11b)(2a+11b)$
25. $(2x-5yz)(4x^2+10xyz+25y^2z^2)$ 27. $(x^2y+z^3)(x^4y^2-x^2yz^3+z^6)$
29. $(ab-c^2d^2)(ab+c^2d^2)$ 31. $(2n^3-3m^4)(4n^6+6n^3m^4+9m^8)$
33. $(xy^4+a^3b^6)(x^2y^8-xy^4a^3b^6+a^6b^{12})$ 35. $2(x^2-2)(x^2+2)$
37. $8(p^2-q^3)(p^4+p^2q^3+q^6)$ 39. $xy^4(xy+1)(x^2y^2-xy+1)$
41. $-2(ab^4-2)(ab^4+2)$ 43. $xy^2(yz^2-x)(y^2z^4+xyz^2+x^2)$

45. $(x-3)(x+3)(x^2+9)$ 47. $(a^2bc^3-3)(a^4b^2c^6+3a^2bc^3+9)$
 49. $2x(2y^2+3x)(4y^4-6xy^2+9x^2)$ 51. $3x^3y(3y-1)(3y+1)$
 53. $3x(3x-2y^2)(9x^2+6xy^2+4y^4)$ 55. $(x-y)(x+y)(x^2+y^2)(x^4+y^4)$
 57. $(x-y)(x^2+xy+y^2)(x^6+x^3y^3+y^6)$ 59. $2(x-1)(x^2+x+1)(x+1)(x^2-x+1)$

4.6

1. $(5y+3)(y-7)$ 3. $(x-2)(x^2+2x+4)$ 5. $(6x+y)(2x-3y)$
 7. $(2x-1)(4x^2+3)$ 9. $(2x-9)(2x+9)$ 11. $(7x-3)(2x-5)$
 13. $(x+2)(4x^2-3)$ 15. $(a+3)(a^2-3a+9)$ 17. $(3x+2y)(9x^2-6xy+4y^2)$
 19. $-(a^2+4)(a-5)$ 21. $5x^2(x-4)(x-2)$ 23. $(n-1)(n+1)(n^2+1)$
 25. $4x^3(5x-3)(x+2)$ 27. $(b-2)(b+2)(b^2+4)$ 29. $(a-3)(a+3)(a^2-3)$
 31. $5ab(a+8)(a-2)$ 33. $3x(x+5)(x+2)$ 35. $u^2(u+8)(u-7)$
 37. $(x+5)(x+y)$ 39. $4x(3x-4)(3x+4)$ 41. $(x-d)(x+7)$
 43. $5(7x+1)(x-3)$ 45. $(y+8)(x-y)$ 47. $(x+2y)(x^2-2xy+4y^2)$
 49. $2a(x-5)(x-6)$ 51. $(x-y)(x+y)(x^2+y^2)$
 53. $(x-2)(x+2)(x-5)(x+5)$ 55. $2x^2(2x+7)^2$ 57. $m(3n-8)(n-3)$
 59. $xy(2x-7y)(2x+7y)$ 61. $5(x-2y)(x+6y)$ 63. $2(3x-y)(x^2+4)$
 65. $x^2y(2x+5)(x-4)$ 67. $3xy(3x+5y)(x+2y)$
 69. $3x(x^6y^3-3z)(x^{12}y^6+3x^6y^3z+9z^2)$ 71. $2ab^3(3a^2b+20ab^2+4)$
 73. $(t-6)(t+6)(t-1)(t+1)$ 75. $2ab(a^3b-12)(a^3b+12)$
 77. $(x-3)(x+3)(x-1)(x^2+x+1)$ 79. $(x^3y^4+z^5)(x^6y^8-x^3y^4z^5+z^{10})$
 81. $a^2b^2(2a-b)(3a-4b)$ 83. $y(x-1)(x^2+x+1)(x+1)(x^2-x+1)$
 85. $x(x-2)(x+2)^2$

4.7

1. $\{-2, 3\}$ 3. $\{\frac{1}{5}, \frac{3}{2}\}$ 5. $\{-3, 0, 9\}$ 7. $\{-\frac{1}{2}, 0, 2\}$ 9. $\{-\frac{2}{5}, 2, 3\}$ 11. $\{3, 9\}$
 13. $\{-9, \frac{5}{4}\}$ 15. $\{-\frac{1}{2}, \frac{1}{2}\}$ 17. $\{-\frac{1}{2}, 3\}$ 19. $\{-\frac{3}{2}, 4\}$ 21. $\{-\frac{1}{3}, -\frac{3}{2}\}$ 23. $\{0, 3\}$
 25. $\{-4, 0, 4\}$ 27. $\{-10, 10\}$ 29. $\{-2, 1\}$ 31. $\{-7, 0, \frac{5}{3}\}$ 33. $\{-2, 0, 2\}$ 35. $\{-1, 15\}$
 37. $\{-4, 9\}$ 39. $\{-2, 3\}$ 41. $\{-1, 3\}$ 43. $\{-6, 6\}$ 45. $\{-9, 2\}$ 47. $\{-3, 1\}$
 49. $\{-4, 4\}$ 51. $\{-3, -1\}$ 53. $\{-3, 2\}$ 55. $\{\frac{2}{3}, \frac{3}{2}\}$ 57. $\{-7, 4\}$ 59. $\{-3, 2\}$
 61. $\{-1, 0, \frac{3}{2}\}$ 63. $\{-2, 0, \frac{5}{3}\}$

4.8

1. 17 and 18 3. 12 and 15 5. Andrew is 18 and Ethan is 12 7. 22 years old
 9. Joshua is 11 and McKay is 10 11. 8 ft X 13 ft 13. 5 ft X 8 ft
 15. 20 yds X 30 yds 17. 9 in X 4 in 19. 9 ft X 7 ft 21. 10 in X 7 in
 23. 5 yds X 20 yds 25. 8 in base, 21 in height 27. 12 people 29. 10 appliances
 31. $\frac{1}{2}$ a month and 15 months 33. 2 sec 35. 6 feet 37. 2 sec 39. 6 sec
 41. 3 sec 43. 4.75 sec 45. 1 sec 47. 5 sec 49. 1.5 sec and 4.5 sec

