

Chapter 3 answers

3.1

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|--------------------------------|----------------------------|--------------------------|----------------------------|---------------------------|---------------------------|
| 1. x^6 | 3. a^{10} | 5. x^2 | 7. $\frac{b^{12}}{c^{16}}$ | 9. 1 | 11. $81x^8$ |
| 13. $5x$ | 15. $\frac{ac}{b^2}$ | 17. $\frac{1}{ab^2}$ | 19. $\frac{9}{4x^{14}}$ | 21. $6a^9b^5$ | 23. $\frac{x^6z^9}{y^3}$ |
| 25. $\frac{4}{a^6b^8}$ | 27. $\frac{64}{x^{15}y^6}$ | 29. $\frac{64}{x^9y^6}$ | 31. $\frac{729a^4}{b^6}$ | 33. $\frac{b^6c^2}{a^6}$ | 35. $\frac{3a^2b^2}{2}$ |
| 37. $\frac{16}{9m^{12}n^{10}}$ | 39. $\frac{x^8z^4}{36y^8}$ | 41. $\frac{a^4b^6}{c^2}$ | 43. $\frac{16x^{12}}{y^6}$ | 45. $\frac{x^{10}}{9y^6}$ | 47. $\frac{a^7}{8b^{11}}$ |
| 49. $\frac{24x^4}{y^7}$ | 51. $\frac{x^5y^7}{128}$ | 53. $12x^2y^5z^5$ | | | |

3.2

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|-----------------------------|------------------------------------|---------------------------|--------------------------------|--------------------------------|------------------------|
| 1. 2.3×10^{10} | 3. 3.45×10^{-6} | 5. 5.87×10^{-10} | 7. 6×10^8 | 9. 3.21×10^{11} | 11. 7×10^{-8} |
| 13. 630,000 | 15. 0.00000136 | 17. 0.00000053 | 19. 4,310,000,000 | 21. 70,000,000,000 | 23. 0.000001 |
| 25. 5.76×10^0 | 27. 4.21×10^{154} | 29. 3.12×10^{28} | 31. 2.5×10^{-21} | 33. 6×10^{-4} | 35. 2×10^2 |
| 37. 2×10^{10} | 39. 1.8×10^{-42} | 41. 1.8×10^{-42} | 43. $\$5.09425 \times 10^{12}$ | 45. 2.5×10^{15} bytes | |
| 47. 5×10^6 gallons | 49. 1.15385×10^{12} times | | | | |

3.3

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|---|--|---------------------------|-----------------------------|----------|--|
| 1. leading term: $2x^2$ | leading coefficient: 2 | degree: 2 | | | |
| 3. leading term: $16x^6$ | leading coefficient: 16 | degree: 6 | | | |
| 5. leading term: x^2 | leading coefficient: 1 | degree: 2 | | | |
| 7. leading term: $-6x^4$ | leading coefficient: -6 | degree: 4 | | | |
| 9. leading term: $-x^{12}$ | leading coefficient: -1 | degree: 12 | | | |
| 11. leading term: $-5a^7$ | leading coefficient: -5 | degree: 7 | | | |
| 13. leading term: $-5b^8$ | leading coefficient: -5 | degree: 8 | | | |
| 15. leading term: $3x^5$ | leading coefficient: 3 | degree: 5 | | | |
| 17. leading term: $-4y^8$ | leading coefficient: -4 | degree: 8 | | | |
| 19. leading term: $-x^9$ | leading coefficient: -1 | degree: 9 | | | |
| 21. $10x^2 + 2x - 51$ | 23. $x^2 - 14$ | 25. x | 27. $2x^3 + 8x^2 + 6x - 11$ | 29. $-x$ | |
| 31. $2x^9 + 6x^6 - 4x^5 - 7x^4 + 7x^2 + 13$ | 33. $6x^3 + x^2 - 6x - 6$ | 35. $3x^2y - 8xy^2 + 7xy$ | | | |
| 37. $8ab + 3a^2b + 4ab^2$ | 39. $4x^2y - 10xy^2 + 10xy$ | | | | |
| 41. $2x^3yz^2 - 16xy^4z^3 - 11x^2y^2z^5 - 3x^2yz^3$ | 43. $5xyz^2 - 17xy^4z^3 - 6x^2y^2z^5 - 4x^2yz$ | 45. 0 | | | |

3.4

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|---|--------------------------------------|---------------------------------|
| 1. $3x^3 - 6x^2 + 3x$ | 3. $4y^4 + 2y^3 - 3y^2$ | 5. $-15x^4 - 35x^3 + 10x^2y$ |
| 7. $x^2 + 7x + 12$ | 9. $x^2 - 100$ | 11. $6x^2 - 17x - 10$ |
| 13. $6x^2 - 7x - 5$ | 15. $x^2 - 4y^2$ | 17. $x^2 - 2x + 1$ |
| 19. $x^2 + 2xh + h^2$ | 21. $4x^2 - 20xy + 25y^2$ | 23. $4x^2 + 12x + 9$ |
| 25. $25x^2y^2 - 20xy + 4$ | 27. $16x^6 - 24x^3 + 9$ | 29. $x^4 - y^4$ |
| 31. $-30x^3 + 57x^2 + 25x - 12$ | 33. $x^4 - x^3 + 5x^2 - 9x - 36$ | 35. $x^3 - 8$ |
| 37. $x^4 + x^2 + 1$ | 39. $x^4 - 13x^2 + 4$ | 41. $x^3 + 3x^2y + 3xy^2 + y^3$ |
| 43. $x^3 - 6x^2 + 12x - 8$ | 45. $27x^3 - 54x^2y + 36xy^2 - 8y^3$ | 51. $x^4 - 1$ |
| 47. $x^2 - 1$ | 49. $x^3 - 1$ | 53. $x^5 - 1$ |
| 55. $x^4 + 2x^3y + 3x^2y^2 + 2xy^3 + y^4 + 2xy + 2x^2 + 2y^2 + 1$ | | |

3.5

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|------------------------------------|------------------------------------|-------------------------------------|
| 1. $2x^3 - 5x^2 + 6$ | 3. $2x^6 - 4x^2 + 5$ | 5. $-9x^7 + 7x^6 + 4x^4 + x$ |
| 7. $-7x^5 + 3x^3$ | 9. $5x^6y^9 - 7x^4y^7 + 6y^3$ | 11. $x + 5$ |
| 13. $x - 4$ | 15. $x - 3 - \frac{6}{x+8}$ | 17. $4x - 14 + \frac{78}{3x+3}$ |
| 19. $x^2 - 2x + 3 - \frac{9}{x+1}$ | 21. $x^2 - 2x + 1 - \frac{4}{x+1}$ | 23. $2x^2 - x + 7 - \frac{22}{x+2}$ |

25. $2x^2 - 3x + 2$

31. $x - 4$

37. $x^3 + 4x^2 + 18x + 12 + \frac{74}{x-4}$

43. $3x - 19 + \frac{89x+35}{x^2+5x+2}$

49. $3x^2 - 2x + 3 + \frac{-2x+5}{x^2-1}$

27. $x^2 - 2x - 8$

33. $x^2 + 3x + 8 + \frac{30}{x-3}$

39. $x^3 + 2x^2 + 19x + 19 + \frac{131}{x-2}$

45. $x + 2 + \frac{8x-1}{x^2-2x+2}$

29. $3x^2 - 5x - 2$

35. $2x^2 - 3x - 10 - \frac{8}{2x+3}$

41. $5x^2 + 15x + 17 + \frac{-24x-83}{x^2-3x+5}$

47. $x^2 - 2x - 4$

3.6

1. $x + 5$

7. $4x - 14 + \frac{78}{3x+3}$

13. $2x^2 - x + 7 - \frac{22}{x+2}$

19. $3x^2 - 5x - 2$

25. $2x^2 - 3x - 10 - \frac{8}{2x+3}$

3. $x - 4$

9. $x^2 - 2x + 3 - \frac{9}{x+1}$

15. $2x^2 - 3x + 2$

21. $x - 4$

27. $x^3 + 4x^2 + 18x + 12 + \frac{74}{x-4}$

5. $x - 3 - \frac{6}{x+8}$

11. $x^2 - 2x + 1 - \frac{4}{x+1}$

17. $x^2 - 2x - 8$

23. $x^2 + 3x + 8 + \frac{30}{x-3}$

29. $x^3 + 2x^2 + 19x + 19 + \frac{131}{x-2}$