

Algebra II **Non-Calculator**
Test Review Chapter 5.1-5.4

Name: _____
Date: _____ Block: _____

Simplify the expression. Leave only positive exponents.

1. $(a^2)^4$	2. $\left(\frac{-3x}{y}\right)^3$
3. $\left(\frac{c}{3}\right)^{-2}$	4. $(-3p^2s^{-4})^3$
5. $\left(\frac{6x^3y}{5xy^2}\right)^5$	6. $\frac{3mn^2}{15m^3n^{-2}}$
7. $\frac{9cd}{3cd^2}$	8. $(w^2x^{-3})(w^4x^2)$
9. $\frac{(a^{-2}b)^3}{a^3b^5}$	10. $\frac{3^3}{3^5}$
11. $7^5 \cdot 7^{-3}$	12. $(3^5)^4$

Write the answer in scientific notation.

13. $(3.1 \times 10^4)(1.2 \times 10^5)$	14. $(1.2 \times 10^3)(1.5 \times 10^6)$
15. $(2.0 \times 10^3)^5$	16. $(3.0 \times 10^7)^4$

Describe the end behavior of the graph of the polynomial function.

17. $P(x) = -2x^5 + x^4 - 7x + 15$	18. $P(x) = -3x^4 + 3x^3 - x - 9$
19. $P(x) = 5x^3 + 4x^2 - 3x + 2$	20. $P(x) = 7x^4 - 3x^2 - 2x + 21$

Use synthetic substitution to evaluate the polynomial function for the given value of x .

21. $P(x) = 3x^5 + 18x^4 + 27x^3 - 2x + 5;$ $x = -3$	22. $P(x) = x^4 - 13x^2 - x + 36; x = 3$
23. $P(x) = 2x^6 - 10x^5 - 12x^4 - 7x + 10;$ $x = 6$	24. $P(x) = x^3 - 2x^2 - 25x + 50; x = -5$
25. $P(x) = -2x^3 - 12x^2 + 30x + 100; x = 4$	26. $P(x) = 2x^6 - 22x^5 + 48x^4 + 72x^3 - 5x + 5;$ $x = 6$

Find the sum or difference.

27. $(x^5 + 3x^4 - 2x + 4) - (x^5 + x^4 - 5x^3 - 1)$	28. $(5x^4 + 3x^3 - 2x^2 + 4) - (x^4 - 5x^2 - x + 1)$
29. $(3x^4 - 2x^2 - 5x + 4) + (x^5 + x^4 - x^3 - 5)$	30. $(3x^5 - x^4 - x^2 + 1) + (x^5 + x^4 - 2x^3 - 7)$

Find the product of the polynomials.

31. $(m+n)^2$	32. $m(m-5)^2$
33. $(3m-2)(m^2+2m-1)$	34. $(m+1)^3$
35. $(3m-2n)(3m+2n)$	36. $(m+5)(2m^2-3m+2)$

Factor the polynomial completely.

37. $a^3 - 5a^2 + 3a - 15$	38. $x^3 + 3x^2 - 2x - 6$
39. $6x^4 - 3x^3 + 15x$	40. $a^5 - 4a^3$
41. $x^3 + 8$	42. $12x^2 - 4x$
43. $2a^3 - a^2 + 6a - 3$	44. $a^3 + a^2 - 3a - 3$
45. $2a^3 - 8a^2 + 3a - 12$	46. $x^3 - 3x^2 - 4x + 12$
47. $x^3 - 1$	48. $3x^3 - 3x^2 + 2x - 2$

Find the real-number solutions of the equation.

49. $x^3 + 5x^2 - 3x - 15 = 0$

50. $x^4 - 7x^2 + 12 = 0$

51. $10x^3 - 160x = 0$

52. $3x^3 - 2x^2 - 3x + 2 = 0$

53. $x^3 + 2x^2 - 6x - 12 = 0$

54. $2x^3 + 6x^2 - 4x - 12 = 0$

55. $x^3 + 3x^2 - 7x - 21 = 0$

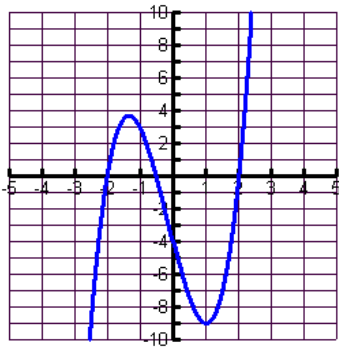
56. $x^3 - x^2 - 4x + 4 = 0$

57. $x^4 - 8x^2 + 16 = 0$

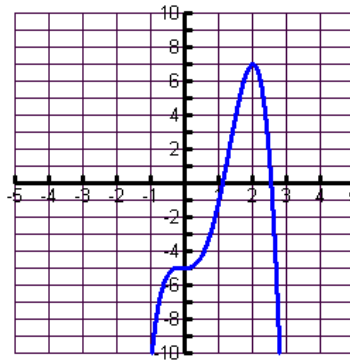
58. $x^4 - 11x^2 + 24 = 0$

Match the graph with its polynomial function.

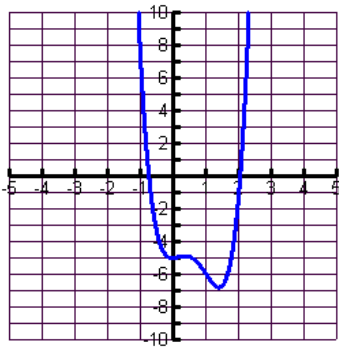
A.)



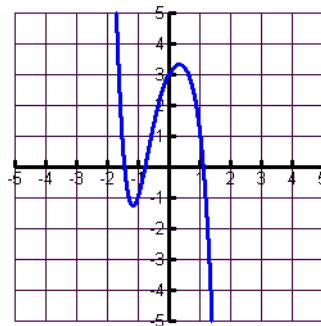
B.)



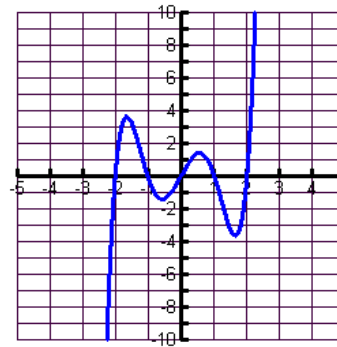
C.)



D.)



E.)



59. $-2x^4 + 5x^3 + x^2 - 5$

60. $-x^5 - 3x^2 + 2x + 3$

61. $2x^3 + x^2 - 8x - 4$

62. $3x^4 - 7x^3 + 3x^2 - 5$

63. $x^5 - 5x^3 + 4x$

Review 5.1-5.4 Answers

1. a^8	2. $\frac{-27x^3}{y^3}$	3. $\frac{9}{c^2}$	4. $\frac{-27p^6}{s^{12}}$
5. $\frac{6^5 x^{10}}{5^5 y^5}$	6. $\frac{n^4}{5m^2}$	7. $\frac{3}{d}$	8. $\frac{w^6}{x}$
9. $\frac{1}{a^9 b^2}$	10. $\frac{1}{9}$	11. 49	12. 3^{20}
13. (3.72×10^9)	14. (1.8×10^9)	15. (3.2×10^{16})	16. (8.1×10^{29})
17. $\uparrow\downarrow$	18. $\downarrow\downarrow$	19. $\downarrow\uparrow$	20. $\uparrow\uparrow$
21. 11	22. -3	23. -32	24. 0
25. -100	26. -25	27. $2x^4 + 5x^3 - 2x + 5$	28. $4x^4 + 3x^3 + 3x^2 + x + 3$
29. $x^5 + 4x^4 - x^3 - 2x^2 - 5x - 1$	30. $4x^5 - 2x^3 - x^2 - 6$	31. $m^2 + 2mn + n^2$	32. $m^3 - 10m^2 + 25m$
33. $3m^3 + 4m^2 - 7m + 2$	34. $m^3 + 3m^2 + 3m + 1$	35. $9m^2 - 4n^2$	36. $2m^3 + 7m^2 - 13m + 10$
37. $(a^2 + 3)(a - 5)$	38. $(x^2 - 2)(x + 3)$	39. $3x(2x^3 - x^2 + 5)$	40. $a^3(a + 2)(a - 2)$
41. $(x + 2)(x^2 - 2x + 4)$	42. $4x(3x - 1)$	43. $(a^2 + 3)(2a - 1)$	44. $(a^2 - 3)(a + 1)$
45. $(2a^2 + 3)(a - 4)$	46. $(x + 2)(x - 2)(x - 3)$	47. $(x - 1)(x^2 + x + 1)$	48. $(3x^2 + 2)(x - 1)$
49. $x = -5, \pm\sqrt{3}$	50. $x = \pm 2, \pm\sqrt{3}$	51. $x = 0, \pm 4$	52. $x = 0, \frac{2}{3}$
53. $x = -2, \pm\sqrt{6}$	54. $x = -3, \pm\sqrt{2}$	55. $x = -3, \pm\sqrt{7}$	56. $x = 1, \pm 2$
57. $x = \pm 2$	58. $x = \pm 2\sqrt{2}, \pm\sqrt{3}$	59. B	60. D
61. A	62. C	63. E	