

Algebra II **Non-Calculator**
Test Review Chapter 5.5-5.9

Name: _____
Date: _____ Block: _____

Perform long division.

1. $(9x^3 - 18x^2 - x + 2) \div (3x + 1)$	2. $(x^4 + 4x^3 - x - 4) \div (x^3 - 1)$
3. $(4x^3 - 2x^2 + 6x - 1) \div (2x + 3)$	4. $(5x^4 + 8x - 9) \div (x^2 - 4)$
5. $(6x^4 - 9x^3 - 19x^2 + 31x - 5) \div (2x^2 + x - 5)$	6. $(2x^4 + 2x^3 - 10x - 9) \div (x^3 + x^2 - 5)$

Perform synthetic division.

7. $(6x^3 - 14x^2 + 10x - 4) \div (x - 1)$	8. $(6x^3 - 7x) \div (x - 2)$
9. $(x^4 + 5x^3 - 2x^2 - 4x + 4) \div (x + 3)$	10. $(2x^3 + 7x^2 + 4x - 1) \div (x + 1)$
11. $(3x^5 + 2x^3 - 5x + 1) \div (x - 1)$	12. $(x^4 - 3x^3 + 3x^2 - 5x - 7) \div (x - 3)$

A polynomial f and a factor of f are given. Factor f completely.

13. $f(x) = x^3 + 2x^2 - x - 2; (x - 1)$	14. $f(x) = 3x^3 + 10x^2 - x - 12; (x + 3)$
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15. $f(x) = x^3 + x^2 - 16x - 16; (x + 4)$

16. $f(x) = 2x^3 - 5x^2 - 28x + 15; (x - 5)$

A polynomial f and one zero of f are given. Find the other zeros of f .

17. $f(x) = x^3 - 10x^2 - 3x + 108; x = 4$

18. $f(x) = x^3 - x^2 - 5x - 3; x = -1$

19. $f(x) = x^3 - 7x^2 + 4x + 12; x = 2$

20. $f(x) = x^3 - 2x^2 - 25x + 50; x = -5$

Find all the zeros of the polynomial function.

21. $6x^3 + 11x^2 - 3x - 2 = 0; x = -2$

22. $x^4 - 3x^3 + 5x^2 - 27x - 36 = 0; x = -1$

23. $x^4 - 13x^3 + 55x^2 - 91x = 0; x = 7$

24. $x^3 - 5x^2 + 7x - 35 = 0; x = 5$

25. $4x^3 + 16x^2 - 22x - 10 = 0; x = -5$

26. $x^4 - x^2 - 20 = 0$

27. $2x^4 - 50 = 0$	28. $x^3 - 4x^2 + 9x - 36 = 0; x = 4$
29. $x^3 + 2x^2 - 5x - 10 = 0$	30. $x^3 - 4x^2 - 3x + 18 = 0; x = 3$

Write a polynomial function with a leading coefficient of 1 given the zeros.

31. $-2, 1, 3$	32. $-1, 3i, -3i$
33. $0, 1, -i, i$	34. $2, \sqrt{3}, -\sqrt{3}$

Write a cubic function whose graph passes through the given points.

35. $(-1, 0), (0, 16), (2, 0), (4, 0)$	36. $(-4, 0), (-2, 0), (2, 0), (0, -8)$
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You may use your calculator on this portion of the test.

37. Find the y-intercept of: $f(x) = 2x^3 - x^2 - 5x + 2$.

38. Find the local minimum or maximum of: $f(x) = x^4 + 2x^2 - 8$.

39. Find the local minimum and maximum of: $f(x) = 2x^3 - x^2 + 2x - 3$.

40. Find all roots of the function: $f(x) = x^4 - 5x^3 + 3x^2 + x$

41. Find the zeros of: $f(x) = x^3 - 7x^2 + 15x - 9$.

Review 5.5-5.9 Answers

1. $3x^2 - 7x + 2$	2. $x + 4$	3. $2x^2 - 4x + 9 - \frac{28}{2x+3}$	4. $5x^2 + 20 + \frac{8x+71}{x^2-4}$
5. $3x^2 - 6x + 1$	6. $2x - \frac{9}{x^3 + x^2 - 5}$	7. $6x^2 - 8x + 2 - \frac{2}{x-1}$	8. $6x^2 + 12x + 17 + \frac{34}{x-2}$
9. $x^3 + 2x^2 - 8x + 20 - \frac{56}{x+3}$	10. $2x^2 + 5x - 1$	11. $3x^4 + 3x^3 + 5x^2 + 5x + \frac{1}{x-1}$	12. $x^3 + 3x + 4 + \frac{5}{x-3}$
13. $(x-1)(x+1)(x+2)$	14. $(x+3)(x-1)(3x+4)$	15. $(x+4)(x-4)(x+1)$	16. $(x-5)(x+3)(2x-1)$
17. $x = -3, x = 9$	18. $x = -1, x = 3$	19. $x = -1, x = 6$	20. $x = 2, x = 5$
21. $-2, \frac{1}{2}, -\frac{1}{3}$	22. $-1, 4, \pm 3i$	23. $0, 7, 3 \pm 2i$	24. $5, \pm i\sqrt{7}$
25. $-5, \frac{1 \pm \sqrt{3}}{2}$	26. $\pm\sqrt{5}, \pm 2i$	27. $\pm\sqrt{5}, \pm i\sqrt{5}$	28. $4, \pm 3i$
29. $-2, \pm\sqrt{5}$	30. $-2, 3$	31. $y = x^3 - 2x^2 - 5x + 6$	32. $y = x^3 + x^2 + 9x + 9$
33. $y = x^4 - x^3 + x^2 - x$	34. $y = x^4 - x^3 + x^2 - x$	35. $y = 2x^3 - 10x^2 + 4x + 16$	36. $f(x) = \frac{1}{2}x^3 + 2x^2 - 2x - 8$
37. 2	38. -8	39. $\max : y = -2.780$ $\min : y = -4.516$	40. $0, 1, 2 \pm \sqrt{5}$
41. 1, 3	42.	43.	