Name _____ Date _____ Period _____

ALGEBRA II REVIEW CHAPTERS 5 TO 9

POLYNOMIAL FUNCTIONS EXPRESSIONS AND EQUATIONS – RATIONAL FUNCTIONS

Write a polynomial function in standard form with the given zeros.

1. $x = 3, 2, -1$ **2.** $x = 1, 1, 2$ **3.** $x = -2, -1, 1$

Find the zeros of each function. State the multiplicity of multiple zeros.

4. $y = (x - 2)(x + 4)$ **5.** $y = (x - 7)(x - 3)$

6. $y = (x + 1)(x - 8)(x - 9)$ **7.** $y = x\,(x + 1)(x + 5)$

Find the real or imaginary solutions of each equation by factoring.

8 $x^3 + 27 = 0$ **9.** $8x^3 = 125$ **10.** $9 = 4x^2 - 16$

11. $x^2 + 400 = 40x$ **12.** $0 = 4x^2 + 28x + 49$ **13.** $-9x^4 = -48x^2 + 64$

Find all the zeros of each function.

14. $f(x) = x^3 - 4x^2 + x + 6$ **15.** $g(x) = 3x^3 - 3x^2 + x - 1$

16. $h(x) = x^4 - 5x^3 - 8x + 40$ **17.** $f(x) = 2x^4 - 12x^3 + 21x^2 + 2x - 33$

Divide.

18. $(x^3 - 3x^2 + 2) \div (x - 1$ **19.** $(x^3 - x^2 - 6x) \div (x - 3)$

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Simplify each sum or difference. State any restrictions on the variables.

20. $\frac{6x+1}{x+2}+\frac{2x-5}{2x+4}$

21. $\frac{8}{x^2-25}+\frac{9}{x-5}$

22. $\frac{x-3}{x^2+3x}+\frac{7}{x+3}$

23. $\frac{3x}{x^2+5x+6}-\frac{2x}{x^2+8x+16}$

Solve each equation. Check each solution.

24. $\frac{x}{4}=\frac{x+1}{3}$

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

26. $\frac{3x}{5}+\frac{4}{x}=\frac{4x+1}{5}$

27. $\frac{3x}{x-2}=4+\frac{x}{5}$

28. $x+\frac{x}{4}-\frac{x}{5}=21$

29. $\frac{3}{x+4}+\frac{5}{4}=\frac{18}{x+4}$