Algebra 2H
Review 6-4 to 6-9

Name_____

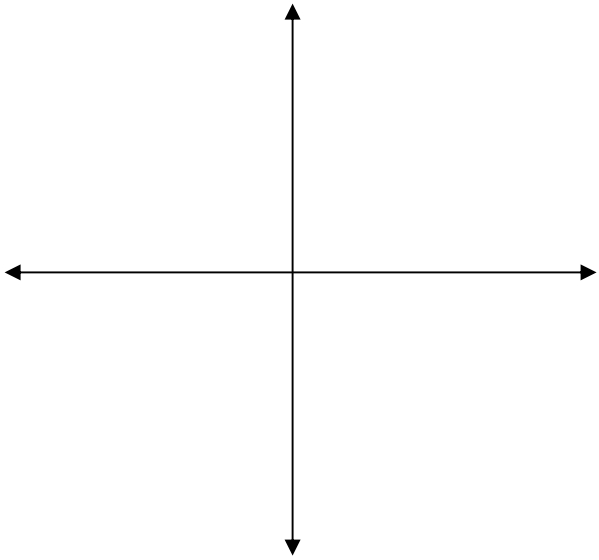
Period_____ **Column**_____

1. Find all zeros of the function: $4x^7 + 12x^6 - 29x^5 - 49x^4 - 20x^3 - 106x^2 + 108x + 80$

a. total number of zeros_____

b. upper bound_____ **lower bound**_____

c. graph **y-intercept**_____



d. Zeros:_____

Factor completely: 2. $512x^{16} - 2$ 3. $125x^6 - 27y^3$

4. $25x^{8c} - 110x^{4c}y^{3n} + 121y^{6n}$ 5. $x^2 - 6xy + 9y^2 - 49a^2 + 14a - 1$

6. $(x+2)^4 + (x+2)$

Factor by completing the square: 7. $4x^4 + 81$ 8. $x^2 + 26x - 2432$

Solve over the complex numbers: 9. $2x^4 - 162 = 0$ 10. $3x^3 - 24 = 0$

11. $3x^5 - 10x^3 = 8x^3 + 48x$ 12. $4x^4 - 25x^2 + 36 = 0$

13. $15x^3 + 10x^2 - 105x - 70 = 0$

14. Use polynomial long division to find the quotient:
$\left(4x^5 - 8x^3 + 4x^2 + 3x - 8\right) \div \left(2x^2 - 1\right)$

15. Use synthetic division to divide: $\left(-6x^3 - 14x^2 + 11x - 3\right) \div (x+3)$

16. Is $-i\sqrt{2}$ a zero of $f(x) = x^4 + x^3 + 2x - 4$? Explain your answer.

17. If -2 and $\frac{3}{4}$ are zeros of $f(x) = 8x^5 + 30x^4 + 37x^3 + 8x^2 - 26x - 12$, find the other zeros.

18. Write a polynomial function $f(x)$, given the zeros $\frac{-1}{2}$, $\sqrt{3}$, and $4 - 3i$.

19. Graph: $f(x) = \frac{1}{12}(x+4)(x-3)(x+1)^2$

20. Write a cubic function if its graph passes through (-4, 0), (-1, 0), (-2, 1), and (4, 0).

ANSWERS: 2. $2(16x^8+1)(4x^4+1)(2x^2+1)(2x^2-1)$ 3. $(5x^2 - 3y)(25x^4 + 15x^2y + 9y^2)$

4. $(5x^{4c} - 11y^{3n})^2$ 5. $(x - 3y + 7a - 1)(x - 3y - 7a + 1)$ 6. $(x+2)(x+3)(x^2+3x+3)$

7. $(2x^2 + 9 + 6x)(2x^2 + 9 - 6x)$ 8. $(x - 38)(x + 64)$ 9. $\pm 3i, \pm 3$

10. $2, -1 \pm i\sqrt{3}$ 11. $0, \pm 2\sqrt{2}, \pm i\sqrt{2}$ 12. $\pm\frac{3}{2}, \pm 2$ 13. $\pm\sqrt{7}, \frac{-2}{3}$

14. $2x^3 - 3x + 2 - \frac{6}{2x^2 - 1}$ 15. $-6x^2 + 4x - 1$ 16. yes 17. $\frac{-1}{2}, -1 \pm i$

18. $f(x) = 2x^5 - 15x^4 + 36x^3 + 70x^2 - 126x - 75$ 19. see graph 20. $f(x) = \frac{1}{12}(x+4)(x+1)(x-4)$