

Algebra III
Chapter 2
Review

Name _____

Date _____

- 1) Let $f(x) = x^2 + x$. Evaluate and simplify each of the following.
 - a. $f(3i)$
 - b. $f(n + 2)$

- 2) Find the quotient and the remainder when $x^4 - 2x^2 - 10$ is divided by $x - 1$.

- 3) Is $x + 2$ a factor of $x^4 - 2x^3 + 9x - 8 = 0$? Explain your decision.

- 4) Find the sum and the product of the following.
 - a. $2x^4 + 4x^3 - 6x^2 + 2x - 4 = 0$
 - b. $x^3 + 2x - 5 = 0$

- 5) Write the polynomial function that has a degree of 3, a constant of 5, a linear coefficient of -4, whose quadratic term is $7x^2$, and a leading coefficient of 9.

- 6) Find all of the zeros of $p(x) = x^3 + 3x^2 - 4x - 12$.

- 7) Find a quadratic equation with integral coefficients and with the roots of $4 \pm \sqrt{3}$.
- 8) A given polynomial function has roots of 2, and $5 \pm i$. Based on this information, describe the graph of this polynomial function.
- 9) Find a cubic equation with integral coefficients and with roots 3 and $5 + i$.
- 10) If $x = 3$ is a root of $2x^3 - 5x^2 - 4x + 3 = 0$, find the remaining roots.
- 11) The polynomial $p(x) = 5x^4 - 3x + 2$ is not factorable. List all the possible rational roots to this quartic function. You do NOT have to solve the function.

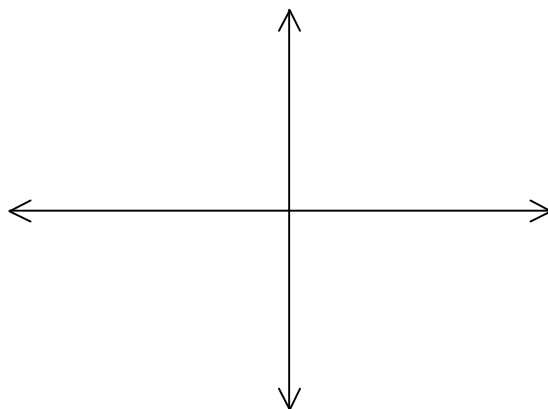
Solve the following equations by factoring. Give all real and imaginary roots.

12) $x^3 - 3x^2 + 4x - 12 = 0$

13) $x^4 + 3x^2 - 10$

- 14) Sketch the graph of the following.

$$y = x^4 - 10x^3 + 25x^2$$



- 15) Let $p(x) = 7 - 8x + x^2$. Does this graph have a maximum or minimum value? Explain your decision. Also, find the maximum or minimum value.

- 16) Name the type of equation, leading term, leading coefficient, degree, and constant of the following polynomials.

a) $8x^3 + x^2 - 6x + 5$

b) $8x^4 - 7x + 3 - x^5$

- 17) Given $2x^3 - 7x + 2 = 0$

a) List all of the possible rational roots of the function.

b) Find the roots of the function.