

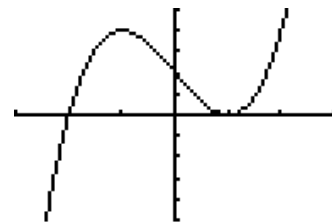
Name _____

Date _____

1. Divide using **long division**: $g(x) = \frac{3x^5 - 2x^3 + x^2 - 7}{x + 2}$. Clearly state your final answer.

2. List all possible rational zeros of the polynomial $f(x) = 3x^3 - 2x^2 + x + 4$.

3. If each mark along the axes represents one unit, determine the equation, in standard form, of the cubic represented by the graph at the right.



4. How many zeros must each of the following polynomials have?

a. $y = x^3 - 2x + 7$

b. $y = x^4 + 2$

c. $y = x^2 - 3x^3 + x^5$

5. Determine if $x - 4$ a factor of $g(x) = x^4 - 3x^3 - x^2 - 11x - 4$ using synthetic division.

6. Determine if $x - 3$ a factor of $h(x) = 2x^3 - 11x^2 + 12x + 6$ using synthetic division.

7. Consider the 7th degree polynomial $f(x) = (x+5)(x-1)^2(x+4)^3(x-8)$ written in factored form. Determine all of the zeros of this polynomial and classify each zero with its multiplicity.
8. Determine the cubic polynomial whose roots are $\{-2, 4, 7\}$ if its leading coefficient is 1.
9. Solve the cubic $2x^3 - 7x^2 - 10x + 24 = 0$
10. Factor the quartic polynomial given by the equation $f(x) = x^4 + 3x^3 - 2x^2 - 3x + 1$
11. A quartic has two complex zeros of $5 + \sqrt{3}i$ and $2 - 3i$.
- What are its other two zeros?
 - If the leading coefficient of this quartic is equal to 1, then write an equation for the quartic in standard form.
12. A cubic has one complex root of $2 + 3i$ and one real root of 4. It has a y-intercept of 52. Write the equation of the cubic in standard form.