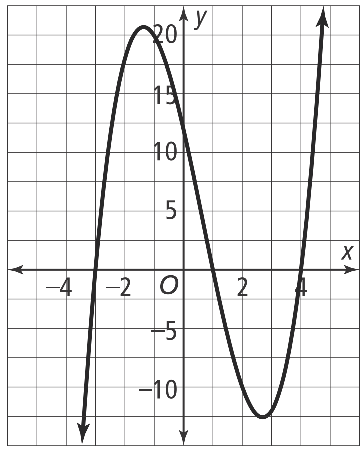
Name ______________________________

3-6 Reteach to Build Understanding

Theorems About Roots of Polynomial Equations

Use the graph of $P(x) = x^3 - 2x^2 - 11x + 12$ to answer the following questions.



1a. Circle the points where the graph intersects the x-axis.

1b. What are the points that intersect the x-axis ?

Next, use the Rational Root Theorem to check those answers.

The Rational Root $= \frac{p}{q}$

Part of the Equation	Definition	Number to Be Factored	Factors
p	a_0 = the value of $P(0)$ = the constant	12	$\pm$
q	a_n = the leading coefficient	1	$\pm$

1c. List all of the possible roots as $\frac{p}{q} \cdot \pm$

1d. Next input all of the roots into the equation. Which factors make $P(x) = 0$?

2. Isabel believes that $f(x) = x^3 - 9x^2 + 27x - 27$ has 3 complex roots. Nicky told her that it has 4 complex roots. Who is correct? What error was made by the other friend?

3. What is the equation of a quadratic function P with rational coefficients that has a zero of $3 + 2i$?

$$P(x) = [x - (3 + 2i)][(x - (3 - 2i)]$$
$$= [(x - 3) - \underline{\quad}i][(x - \underline{\quad}) + 2i)]$$
$$= (x - \underline{\quad})^2 - (\underline{\quad}i)^2$$
$$= x^2 - \underline{\quad}x + \underline{\quad} - (-\underline{\quad})$$
$$= x^2 - \underline{\qquad} + \underline{\qquad}$$