Trig 4.3

Find the factors of polynomials $R = 0$

Use the remainder theorem

Use the factor theorem

is it a factor of...?

synthetic division

depressed polynomial

activity: whiteboards

Factor Theorem	The binomial $x - r$ is a factor of the polynomial $P(x)$ if and only if $P(r) = 0$.

x-factor
factor by grouping
Synthetic division: How do I decide what to try?

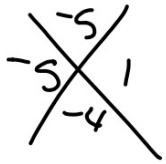
$(x-1)(x-5)(x+1)$

Determine the binomial factors of each polynomial.

9. $x^3 - 5x^2 - x + 5$ ± 1 ± 5

10. $x^3 - 6x^2 + 11x - 6$

$$\begin{array}{r|rrrr} 1 & 1 & -5 & -1 & 5 \\ & \downarrow & 1 & -4 & -5 \\ \hline & 1 & -4 & -5 & 0 \end{array}$$



How do I decide what to try?

4 **Determine the binomial factors of $x^3 - 7x + 6$.**

Lesson 4-3 *(Pages 222–228)*

Divide using synthetic division.

1. $(x^2 + 10x + 8) \div (x + 2)$

3. $(x^3 - 3x - 5) \div (x + 1)$

$x = -1$

$$\begin{array}{r|rrrr} -1 & 1 & 0 & -3 & -5 \\ & \downarrow & -1 & 1 & 2 \\ \hline & 1 & -1 & -2 & -3 \end{array}$$

$x^2 - x - 2 - \frac{3}{x+1}$

Use the Remainder Theorem to find the remainder for each division. State whether the binomial is a factor of the polynomial.

5. $(x^2 + 2x - 8) \div (x + 4)$

6. $(x^3 + 12) \div (x - 1)$

7. $(4x^3 + 2x^2 + 6x + 1) \div (x + 1)$

8. $(x^4 - 4x^2 + 16) \div (x - 4)$

When is synthetic division not appropriate? (have to go old school)