Trig 4.3

Find the factors of polynomials

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 $P(r) = 0$. |

$x=1$

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

$\pm 1$
$\pm 5$

Determine the binomial factors of each polynomial.

9. $x^3 - 5x^2 - x + 5$

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

$1 \;\big|\; 1 \quad -5 \quad -1 \quad 5$

$\downarrow \quad 1 \quad -4 \quad -5$

$1 \quad -4 \quad -5 \quad 0$

$x^2 - 4x - 5$

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

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. $(x^2 + 10x + 8) \div (x + 2)$ -2]
3. $(x^3 - 3x - 5) \div (x + 1)$ -1]

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

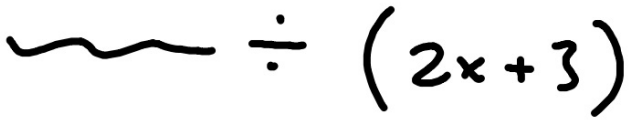
5. $(x^2 + 2x - 8) \div (x + 4)$

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)



WB 4.3

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