Theorem

Remainder Theorem

If a polynomial P(x) of degree $n \ge 1$ is divided by (x - a), where a is a constant, then the remainder is P(a).

This can only be applied when the divisor is linear.

Is x-3 a factor of $2x^3 - 12x^2 + 21x - 9$?

Luce remainder theorem

f(3)

- 2(27) + 2(9)

+ 21(3) - 9

54 - 108 + 63

- 9

=0

Since the remainder is zero x-3 must be a factor Is x + 5 a factor of $2x^3 + x^2 - 4x + 15$?

Only if the remainder is zero!

DIVIDE $2x^2 - 9x + 44$ x + 5 $2x^3 + x^2 - 4x + 15$ $-2x^3 + 10x^4$ $-3x^2 - 4x$ x + 5 x + 5 x + 5 x + 5 x + 5 x + 5 x + 5 x + 5 x + 5 x + 5 x + 6 x + 5 x + 6 x +

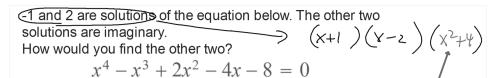
What is the remainder of this quotient?

$$\frac{6x^{2} + 5x - 2}{x - 4} = 6x + 29 \left(\frac{114}{x - 4}\right)^{-1}$$

$$6(4)^{2} + 5(4) - 2$$

$$96 + 20 - 2$$

$$1/6 - 2 = (1)4$$



Start by dividing by one of the factors. Then divide this quotient by the other factor. After the second division you are left with a quadratic you can use to find the last two zeros.

Graph to find all REAL solutions then find the remaining imaginary solutions.

$$x^3 - 4x^2 + x + 26 = 0$$
 $x = -2$

since -2 is a real solution what is a factor of the original polynomial? (x+2)

If x+2 is a factor use polynomial division to find the other factor.

Find the zeros of this other factor.

If x + 2 is a factor, use polynomial division to factor $x^3 + x^2 - 22x - 40$ completely. $\begin{array}{c}
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x + 2
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You can now finish Hwk #30

Sec 6-3

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Due Monday

Problems 34, 35, 37, 40, 42-44