Algebra 2 Ch. 6 Handout 6.3 Dividing Polynomials

You can us polynomial division to help find all the zeros of a polynomial function. Division of polynomials is similar to numerical division.

Recall that when a numerical division has a remainder of zero the divisor and quotient are both factors of the dividend.

If numerical division leaves a nonzero remainder then neither the divisor nor the quotient is a factor of the dividend.

neither 5 nor 8 is a factor of 42.
$$-40$$

$$-8$$

Division serves as a test of whether one number is a factor of another.

The same is true for polynomial division. If you divide a polynomial by one of its factors, then you get another factor. When a polynomial division leaves a zero remainder you have factored the polynomial.

To divide polynomials other than monomials, follow the same procedure you use to divide whole numbers.

Divide
$$x^{2} + 2x - 30$$
 by $x - 5$.

 $x + 7$
 $x - 5$
 $x + 7$
 $7x - 30$
 $-7x + 35$

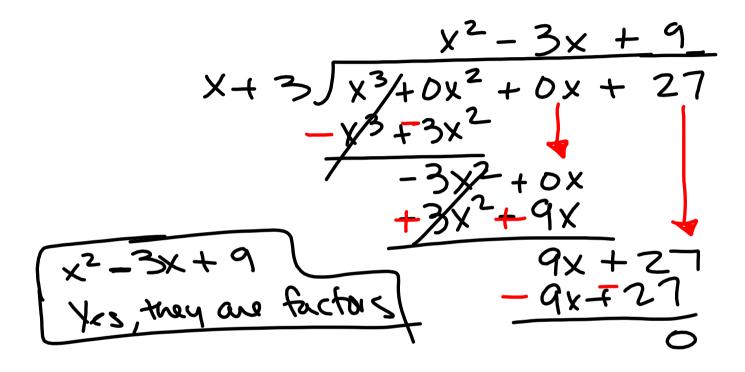
Not factors

Determine whether x + 2 is a factor of each polynomial.

a)
$$x^{2} + 10x + 16$$

 $x + 2 \int x^{2} + 10x + 16$
 $-x^{2} + 2x$
 $-x^{2} + x^{2} - 5x$
 $-x^{2} + x^{2} - x^{2}$
 $-x^{2} + x^$

Divide $x^3 + 27$ by x + 3. Check your answer.



2. Determine whether each divisor is a factor of each dividen

a)
$$(2x^{2}-19x+24) \div (x-8)$$
 b) $(x^{3}-4x^{2}+3x+2) \div (x+2)$
 $x^{2}-4x+15$
 $x+2 \int x^{3}-4x^{2}+3x+2$
 $-(x^{3}+3x^{2})$
 $-(x^{2}+3x)$
 $+(x^{2}+12x)$
Not factors

Not factors

Assignment