Warm up - Review

1) Write in standard form: $5x - 2x^2 + 9 - 6x^2$

$-8x^2 + 5x + 9$

2) Find the zeros, then state the multiplicity of each zero, then graph: $y = -(x - 3)^2(x + 5)$

deg = 3 EB: ↑↓

z: x = 3 | x = -5

m: 2 | 1

3) Factor then find the zeros: $9x^3 + 6x^2 - 3x = 0$

$3x(3x^2 + 2x - 1) = 0$

-3 2 3, -1

4) Write a polynomial in standard form with the given zeros: 7, 0, and -2

$x(x-7)(x+2)$ factored form

$x(x^2-5x-14)$

x^3-5x^2-14x standard form

$3x^2+3x-x-1$

$3x(x+1)-1(x+1)$

$3x(3x-1)(x+1)$

z: x=0 | x=⅓ | x=-1

m: 1 | 1 | 1

$(x-7)^3$

$(x-7)(x-7)(x-7)$

$x^2-14x+49$

x | -7

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6.3 Dividing Polynomials

Remember long division?

How do you do the following problem?

582 ÷ 23

$$\begin{array}{r} 25 \\ 23\overline{)582} \\ -461 \\ \hline 122 \\ -115 \\ \hline 7 \end{array}$$

25 R 7

$25\frac{7}{23}$

23 is not a factor of 582!

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Now we'll divide polynomials the same way. *Get out your note catcher to complete the problem.*

1) Divide $x^3 - 2x^2 - 3x + 10$ by $(x + 2)$

$x^2 - 4x + 5$

$x+2 \;|\; x^3 - 2x^2 - 3x + 10$

$-x^3 \mp 2x^2$

$-4x^2 - 3x$

$+4x^2 + 8x$

$5x + 10$

$-5x \mp 10$

0 → $x+2$ is a factor of the polynomial

$x \cdot ? = -x^3$

$x \cdot ? = -4x^2$

2) Divide $x^2 + 2x - 35$ by $(x - 5)$

$x + 7$

$x-5 \;|\; x^2 + 2x - 35$

$-x^2 + 5x$

$7x - 35$

$-7x + 35$

0

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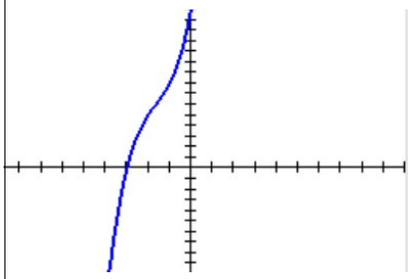
3) <u>Why</u> do we need long division with polynomials? Let's consider the graph of: $y = x^3 + 5x^2 + 11x + 15$.



What is the zero you see in the graph? So what will be the factor? And how will you find the other 2 zero's?

$x = -3$ $(x+3)^3 = x^3 \ldots \ldots + 27$

not y!

Oct 31-10:55 AM

Dividing when all powers are not in the original polynomial.

4) **Divide $x^4 - 5x^3 - 24 - 25x^2$ by (x+3)**

$$x^3 - 8x^2 - x + 3$$
$$x+3 \;|\; x^4 - 5x^3 - 25x^2 + 0x - 24$$
$$-x^4 \mp 3x^3$$
$$-8x^3 - 25x^2$$
$$+8x^3 + 24x^2$$
$$-x^2 + 0x$$
$$+x^2 + 3x$$
$$3x - 24$$
$$-3x \mp 9$$
$$-33$$

$$x^3 - 8x^2 - x + 3 - \frac{33}{x+3}$$

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Determine whether each divisor is a factor of each dividend.

5) **Is (x-8) a factor of $2x^2 - 19x + 24$?**

$$2x - 3$$
$$x-8 \;|\; 2x^2 - 19x + 24$$
$$-2x^2 + 16x$$
$$-3x + 24$$
$$+3x \mp 24$$
$$0$$

6) **Is (x +2) a factor of $x^3 - 4x^2 + 3x + 2$?**

$$x^2 - 6x + 15$$
$$x+2 \;|\; x^3 - 4x^2 + 3x + 2$$
$$-x^3 \mp 2x^2$$
$$-6x^2 + 3x$$
$$+6x^2 + 12x$$
$$15x + 2$$
$$-15x \mp 30$$
$$-28$$

$$x^2 - 6x + 15 - \frac{28}{x+2}$$

not a factor

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Check for Understanding - Partner Work

1) Get with a partner.

2) Go to the google classroom to complete the Math Lib.

3) Work through the problems to fill out the paragraph at the bottom.

4) Try to get through at least half of the problems.

5) What you don't finish in class will be HW.

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