WARM UP -

Chapter 6 Review - Get a whiteboard to complete the review problems. Be sure I can see your work and answers so I can give you feedback.

Let me know how you're feeling today!

How are you feeling today?

Nov 16-1:18 PM

1) Write in standard form, then classify by degree and # of terms:

a) $5x^2(3x - 7)$ b) $(x^2 + 3x)^2$

1a) $15x^3 - 35x^2$ - Cubic Binomial

1b) $x^4 + 6x^3 + 9x^2$ - 4th degree Trinomial

2) Write a polynomial function in standard form with zeros at -4 with a multiplicity of 2 and 0 with a multiplicity of 1.

$$x(x+4)^2 = x(x+4)(x+4)$$ foil

2) $y = x^3 + 8x^2 + 16x$

NO!!!

Dec 7-10:12 AM

3) Use synthetic division and the given factor of (x+2) to factor
   $x^3 + 4x^2 + x - 6$ <u>COMPLETELY</u>.

$$-2\underline{)}\ 1\quad 4\quad 1\quad -6$$
$$\ -2\ -4\quad 6$$
$$\overline{1\quad 2\ -3\quad 0}\ \checkmark \longrightarrow x^2 + 2x - 3 \quad 3 \diagdown \begin{smallmatrix}-3\\-1\end{smallmatrix}$$
$$2$$

3) $(x+3)(x+2)(x-1)$ $(x-1)(x+3)(x+2)$

4) Use synthetic division to see if (x-2) is a factor of $x^4 - 6x^2 - 27$.
Is it a factor? Yes or No?

$$2\underline{)}\ 1\quad 0\quad -6\quad 0\quad -27$$
$$\quad 2\quad 4\ -4\ -8$$
$$\overline{1\quad 2\ -2\ -4\ -35}$$

4) No, since the remainder
   isn't 0. The remainder is -35

5) Use factoring to solve:

5) $x = \pm 3, \pm 2i$ $x^4 - 5x^2 - 36 = 0$ x=3, x=-3 $x^2 = -4$
$$(x^2 - 9)(x^2 + 4) = 0 x = \pm 2i$$
$$(x-3)(x+3)(x^2+4)$$
$$x^3 + 3x^2 - 4x - 12 = 0$$

5) $x = \pm 2, 3$

6) Find the zeros and state the multiplicity of each:
   $f(x) = (4x)(x-3)^2(2x+5)^3$ 6) x = 0, x = 3, x = -5/2
    m. 1   m. 2   m. 3

7) State the end behavior, factor to find zeros then sketch: $y = -2x^4 + 12x^3 - 18x^2$

$-2x^2(x^2 - 6x + 9)$

$(x-3)(x-3)$

$-2x^2(x-3)^2$

$x=0 \mid x=3$

$2 2$
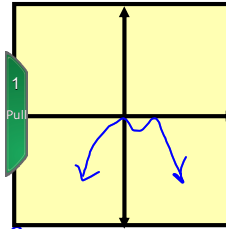
8) One of the zero's of $y = -2x^3 - 5x^2 + 3$ is -1. What are the other two zero's?

8)

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

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

$9 - (\cdot 24)$

$\dfrac{3 \pm \sqrt{9 - 4(-2)(3)}}{2(-2)}$

$\dfrac{3 \pm \sqrt{33}}{-4}$

Dec 6-11:09 AM

9) Use long division to divide:

$x^4 + 2x^3 + x - 3 \div (x - 1)$

9) $x^3 + 3x^2 + 3x + 4 + 1/(x-1)$

Nov 16-1:35 PM

10) Write a cubic polynomial that represents this graph.
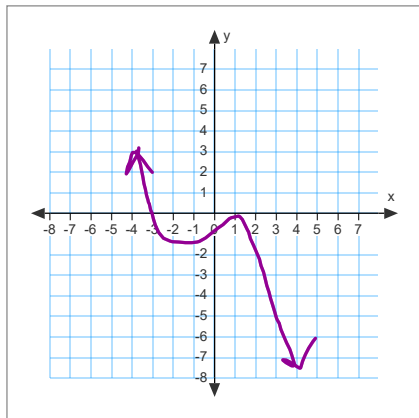
9)

Nov 16-1:51 PM

HW Review Ch 6

WORKBOOK

pg 52: all   part 63   1-15 odd
pg 53 Top Section 6.4 #3-9   Mid Practice 6.5 #1-9 odd
(5,7 use calc &
synthetic division

Nov 15-5:49 AM

DAY 2

Nov 18-3:55 PM

WARM UP - Calculator Review

1) Find the zeros of: $y = 15x^4 - 11x^3 - 14x^2$
Round answers to the nearest hundredth.

1)

2) Find all the zero's.
$2x^4 - 8x^3 - 6x^2 - 16x - 20 = 0$

2)

3) Find a cubic equation, in standard form,
with roots of 3i and 4.

3)

4) Can (x-2) be a factor of $x^3 + 4x^2 - 6x + 7$?
Why or why not?

4)

Nov 13-10:04 AM

Answer Key to WB pg 52-53 is in the calendar! Be sure to check your answers.

Algebra II   Page 52

Practice 6-3   Dividing Polynomials

Determine whether each binomial is a factor of $x^3 + 3x^2 - 10x - 24$.

1. $x + 4$

$$-4 \mid \begin{array}{cccc} 1 & 3 & -10 & -24 \\ & -4 & 4 & 24 \end{array}$$
$$\overline{\quad 1 \;\; -1 \;\; -6 \;\; \lvert 0 \rvert}$$
yes

2. $x - 3$

$$3 \mid \begin{array}{cccc} 1 & 3 & -10 & -24 \\ & & 3 & 18 & 24 \end{array}$$
$$\overline{\quad 1 \;\; 6 \;\; 0 \;\; \lvert 0 \rvert}$$
yes

Divide using long division.

3. $(2x^2 + x - 7) \div (x - 5)$ $2x - 11 + \frac{48}{x-5}$

4. $(x^3 + 5x^2 - 3x - 1) \div (x - 1)$ $x^2 + 6x + 4 + \frac{3}{x-1}$

5. $(3x^3 - x^2 - 7x + 6) \div (x + 2)$ $3x^2 - 7x + 7 - \frac{8}{x+2}$

Divide using synthetic division.

6. $(x^3 - 8x^2 + 17x - 10) \div (x - 5)$ $x^2 - 3x + 2$

7. $(x^3 + 5x^2 - x - 9) \div (x + 2)$ $x^2 + 3x - 7 + \frac{5}{x+2}$

Use synthetic division and the Remainder Theorem to find P(a).

8. $P(x) = 3x^3 - 4x^2 - 5x + 1; a = 2$

$$2 \mid \begin{array}{cccc} 3 & -4 & -5 & 1 \\ & 6 & 4 & -2 \end{array}$$
$$\overline{\quad 3 \;\; 2 \;\; -1 \;\; -1}$$ $\boxed{P(2) = -1}$

9. $P(x) = x^3 + 6x^2 + 10x + 3; a = -3$

$$-3 \mid \begin{array}{cccc} 1 & 6 & 10 & 3 \\ & -3 & -9 & -3 \end{array}$$
$$\overline{\quad 1 \;\; 3 \;\; 1 \;\; 0}$$ $\boxed{P(-3) = 0}$ b/c

Use synthetic division and the given factor to completely factor each polynomial function.

10. $y = x^3 + 3x^2 - 13x - 15; (x + 5)$

$$-5 \mid \begin{array}{cccc} 1 & 3 & -13 & -15 \\ & -5 & 10 & 15 \end{array}$$
$$\overline{\quad 1 \;\; -2 \;\; -3 \;\; 0}$$ $x^2 - 2x - 3$ $\boxed{(x-3)(x+1)(x+5)}$

11. $y = x^3 - 3x^2 - 10x + 24; (x - 2)$

$$2 \mid \begin{array}{cccc} 1 & -3 & -10 & 24 \\ & 2 & -2 & -24 \end{array}$$
$$\overline{\quad 1 \;\; -1 \;\; -12 \;\; 0}$$ $x^2 - x - 12$ $\boxed{(x-4)(x+3)(x-2)}$

Divide.

12. $(6x^3 + 2x^2 - 11x + 12) \div (3x + 4)$ MUST USE LONG DIV

$2x^2 - 2x - 1 + \frac{16}{3x+4}$

13. $(x^4 + 2x^3 + x - 3) \div (x - 1)$

$$1 \mid \begin{array}{ccccc} 1 & 2 & 0 & 1 & -3 \\ & 1 & 3 & 3 & 4 \end{array}$$
$$\overline{\quad 1 \;\; 3 \;\; 3 \;\; 4 \;\; \lvert 1 \rvert}$$
$x^3 + 3x^2 + 3x + 4 + \frac{1}{x-1}$

14. $(x^4 - 3x^2 - 10) \div (x - 2)$

$$2 \mid \begin{array}{ccccc} 1 & 0 & -3 & 0 & -10 \\ & 2 & 4 & 2 & 4 \end{array}$$
$$\overline{\quad 1 \;\; 2 \;\; 1 \;\; 2 \;\; \lvert -6 \rvert}$$
$x^3 + 2x^2 + x + 2 - \frac{6}{x-2}$

15. A box is to be mailed. The volume in cubic inches of the box can be expressed as the product of its three dimensions: $V(x) = x^3 - 16x^2 + 79x - 120$. The length is $x - 8$. Find linear expressions for the other dimensions. Assume that the width is greater than the height.

$$8 \mid \begin{array}{cccc} 1 & -16 & 79 & -120 \\ & 8 & -64 & 120 \end{array}$$
$$\overline{\quad 1 \;\; -8 \;\; 15 \;\; 0}$$ $\boxed{(x-5)(x-3)(x-8)}$
$x^2 - 8x + 15$

Factor the expression on the left side of each equation. Then solve the equation.

1. $8x^3 - 27 = 0$

2. $x^3 + 64 = 0$

3. $x^4 - 5x^2 + 4 = 0$ $x = \pm 2, \pm 1$

4. $x^4 - 10x^2 + 16 = 0$ $x = \pm 2\sqrt{2}$ $x = \pm\sqrt{2}$

5. $x^4 - 81 = 0$ $x = \pm 3, \pm 3i$

6. $x^3 + 4x^2 + 7x + 28 = 0$ $x = \pm\sqrt{7}i, -4$

Solve each equation by graphing on your calculator. Where necessary, round to the nearest hundredth.

7. $x^3 + 5x^2 - 2x - 15 = 0$ $x = -4.76, -1.9, 1.66$

8. $12x^4 + 14x^3 - 5x^2 - 14x - 4 = 0$

9. $15x^4 = 11x^3 + 14x^2$ $x = 0, -0.67, 1.4$ mult 2

A polynomial equation with rational coefficients has the given roots. Find two additional roots.

1. $2 + 3i$ and $\sqrt{7}$ $2 - 3i$ $-\sqrt{7}$

2. $3 - \sqrt{2}$ and $1 + \sqrt{3}$ $3 + \sqrt{2}$ $1 - \sqrt{3}$

3. $-4i$ and $6 - i$ $4i$ $6 + i$

4. $5 - \sqrt{6}$ and $-2 + \sqrt{10}$ $5 + \sqrt{6}$ $-2 - \sqrt{10}$

Use the Rational Root Theorem to list all possible rational roots for each polynomial equation. Then find any actual rational roots. Verify your roots using synthetic division.

5. $2x^4 = 9x^2 - 4$ $\frac{p}{q} = \pm 1, \frac{1}{2}, 2, 4$ $\boxed{x = \pm 2, \pm \frac{1}{2}}$

6. $x^3 - 5x^2 + 2x + 8 = 0$ $\boxed{x = -1, 2, 4}$

7. $2x^3 + 13x^2 + 17x - 12 = 0$ $\frac{p}{q} = \pm\frac{1}{2}, \frac{3}{2}, 1, 2, 3, 4, 6, 12$ $\boxed{x = -4, -3, \frac{1}{2}}$

8. $6x^3 + 10x^2 + 5x = 0$

Find a third-degree polynomial equation with rational coefficients that has the given number as roots.

9. $5, 2i, -2i$ $(x-5)(x-2i)(x+2i)$ $\boxed{x^3 - 5x^2 + 4x - 20}$

10. $-7, i, -i$ $(x+7)(x^2+1)$ $\boxed{x^3 + 7x^2 + x + 7}$

Nov 29-4:21 PM

OPTIONAL – WB pg. 54 – 55
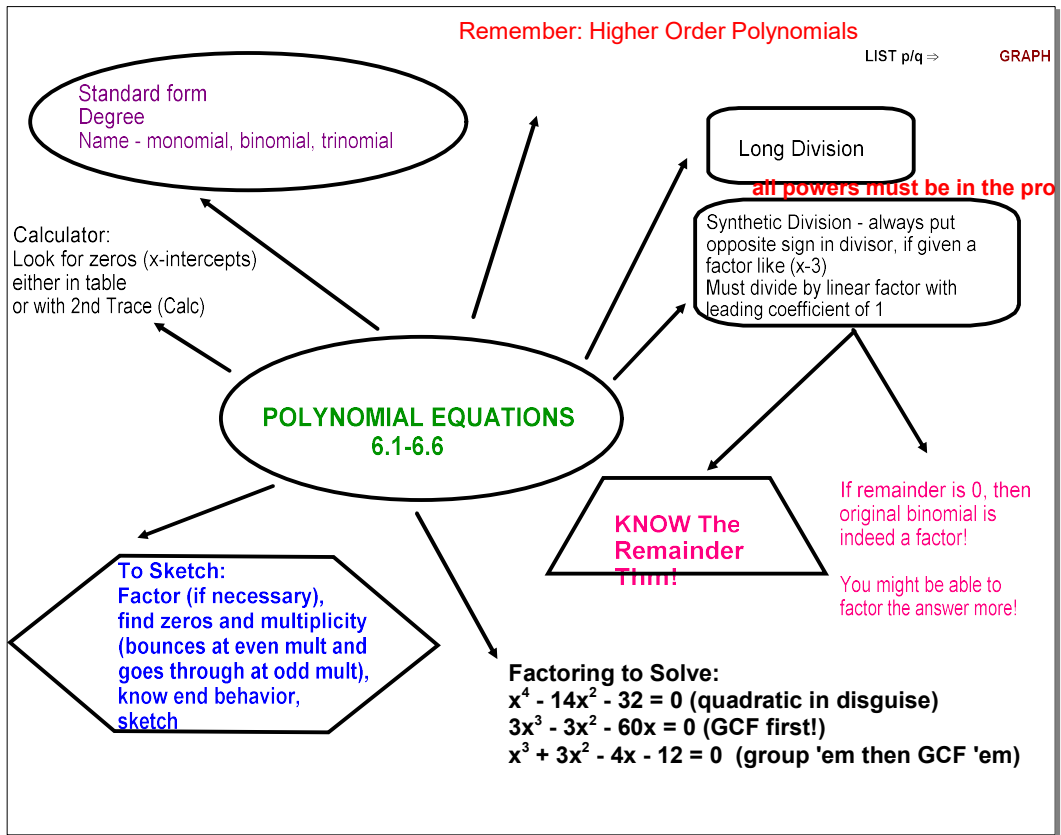
Graphing Match Up in partners

Nov 16-2:06 PM

HOLIDAY *countdown*

HW Review Ch 6 - Day 2

**pg 846 - 1-31odd, 56-60 all**

Nov 15-5:49 AM

EXTRA SLIDES

Nov 16-2:07 PM

Remember: Higher Order Polynomials

LIST p/q ⇒   GRAPH

Standard form
Degree
Name - monomial, binomial, trinomial

Long Division

all powers must be in the pro

Synthetic Division - always put
opposite sign in divisor, if given a
factor like (x-3)
Must divide by linear factor with
leading coefficient of 1

Calculator:
Look for zeros (x-intercepts)
either in table
or with 2nd Trace (Calc)

**POLYNOMIAL EQUATIONS
6.1-6.6**

If remainder is 0, then
original binomial is
indeed a factor!

You might be able to
factor the answer more!

**KNOW The
Remainder
Thm!**

To Sketch:
Factor (if necessary),
find zeros and multiplicity
(bounces at even mult and
goes through at odd mult),
know end behavior,
sketch

Factoring to Solve:
$x^4 - 14x^2 - 32 = 0$ (quadratic in disguise)
$3x^3 - 3x^2 - 60x = 0$ (GCF first!)
$x^3 + 3x^2 - 4x - 12 = 0$ (group 'em then GCF 'em)

Dec 6-11:10 AM

CHECK HW

9. $-1, \dfrac{1 \pm i\sqrt{7}}{4}$

10. $3, \pm i$

11. $4, \dfrac{1 \pm i\sqrt{3}}{2}$

12. $2, \pm\sqrt{3}$

13. $\pm 2, \pm\sqrt{2}$

14. $\pm 2, \pm i$

15. $0, \dfrac{3 \pm 3\sqrt{5}}{2}$

16. $-6, \pm i$

32. C   33. H   34. B   35. H   36. B

Nov 13-3:18 PM
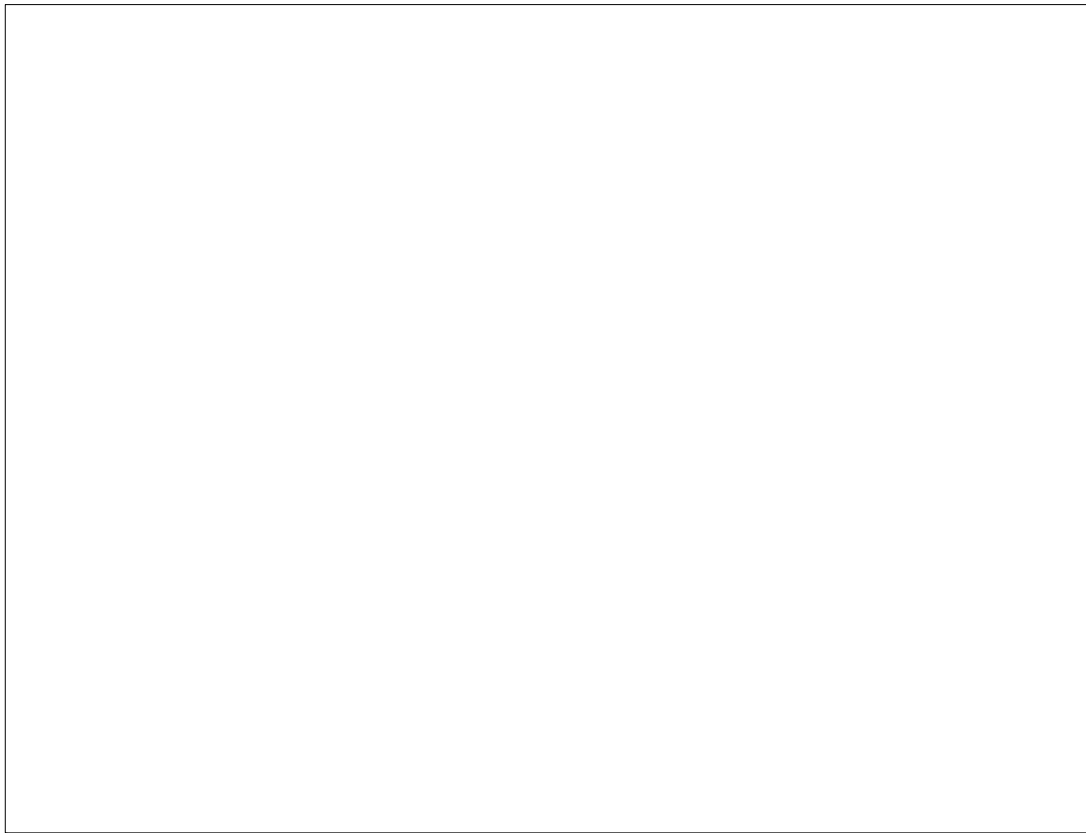
Aug 29-11:17 AM

GO COUGARS!

Algebra II

- NO Calculators - Part I
Clear Calc before and after and show me
2nd + 7 1 2

- Pencils only!

- After your test, watch both 3 minute video

Good Luck!

Aug 29-11:17 AM