BE-Geometry Monday 8-23-10

ACT PRACTICE (≤5 min)

① $|8-6| - |6-8| = ?$

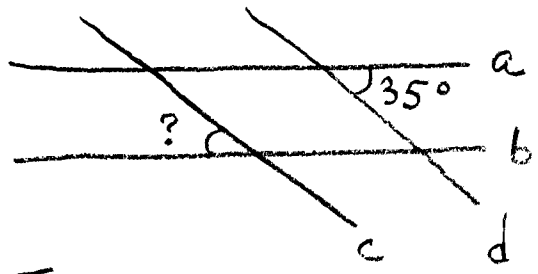
② $(d^{16})^5 = ?$

③ $b = -6 \quad c = 5 \quad t = -2$

$(c-b-t)(b+t) = ?$

④ $5(3+4x) + 6 - x$

⑤



line a // b
c // d

FIND THE MEASURE OF THE ? ANGLE.

- Homework 1 & Quiz 1 Return / Review

Factoring Polynomials

Finding polynomials (usually lower degree) that multiply to produce the original polynomial (product)

---

*(M) Factories make products

(Ex) $4 \cdot 3 = 12$

Monomial factor, degree 0	Monomial factor, degree 0	=	Monomial product, degree 0

(Ex) $4x \cdot 3x = 12x^2$

Monomial factor, degree 1	Monomial factor, degree 1	Monomial product, degree 2

We will often factor monomials, most of the time we will factor 2, 3, or 4 term polynomials. Monomials ⇒ GCF for variables, prime factorization if needed for numbers.

Find factors of $42x^4y^3$

$x^4 \Rightarrow xxxx$

$y^3 \Rightarrow yyy$

42

1 \

(2) 21

/ \

(3) (7)

Factors (use 2, 3, and 7)

$\Rightarrow$ [1, 42] must remember

2, 3·7 = [2, 21]

3, 2·7 = [3, 14]

2·3, 7 = [6, 7]

FTOA $\Rightarrow$ Every number can be written as a product of primes.

Fundamental Theorem of Arithmetic

ONE (of many) uses $\Rightarrow$ Finding All pairs of factors of a number.

Factoring Binomials

Methods ⇒ GCF or DOS Pattern
(difference of squares)

↑ Lucky if it is a DOS. Very common on ACTs. A "must know" for Algebra

(Ex) $5x^2 + 25x$ ⇒ GCF

$\boxed{5x(x+5)}$

(Ex) $3x^2 + 25y$ ⇒ No GCF, prime polynomial (no factors other than 1 & itself)

(Ex) $4x^2 - 1$

$\boxed{(2x+1)(2x-1)}$

DOS

$\boxed{a^2 - b^2 = (a+b)(a-b)}$

Skip Trinomials, look at 4-term poly's

Factoring 4-term Polynomials

Methods ⇒ GCF or FBG
(Factor By Grouping)

(Ex) $3x^4y^3 + 6x^3y + 12x^2y + 6xy^3$

$3x^2y(x^2y^2 + 2x + 4 + 2y^2)$ ⇒ GCF

(Ex) $4x^2 - 2x + 6x - 3$ ⇒ No GCF, Try FBG, may reorder if needed.

$(4x^2 - 2x) + (6x - 3)$

Note: 2/3 works or none work ⇒ only reorder once (next page)

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

GCF = $(2x-1)$ GCF = $(2x-1)$

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

MathForum.org great site for math help. Go to "Ask Dr. Math" and use the Search box. I went there and input factor by grouping and found a very good explanation and some useful tips that are not in the book and are new to me:

Ex) A 4 term polynomial has 3 possible groups: $a+b+c+d$

① $(a+b)+(c+d)$

② $(a+c)+(b+d)$

③ $(a+d)+(b+c)$

If FBG works, 2 of these groups will work and 1 will not!

If FBG does not work, 0 of the groups will work!

The "biggie", factoring trinomials of the second degree in one variable...
Why? Because if the ax^2+bx+c can be factored we can use the Zero Product Property (ZPP) to solve the Quadratic Equation $ax^2+bx+c=0$.

"Magic Number Method" (of factoring ax^2+bx+c)

(Ex) $15x^2-x-2 \Rightarrow ax^2+bx+c$

Sum = b = -1

prod = ac = -30

$+5 \quad -6$

Find 2 magic numbers whose sum is b and product is ac

$15x^2+5x+-6x-2$

$(15x^2+5x)+(-6x-2)$

$5x(3x+1)+-2(3x+1)$

$(3x+1)(5x-2)$

(Ex) $x^2 + 2x^2 + 15x - 18$

$3x^2 + 15x - 18$

STANDARD FORM $ax^2 + bx + c$

GCF!!!

$3(x^2 + 5x - 6)$

Sum = 5
Prod = −6
−1 +6

NOTE: 2, 3 will NOT WORK, WHY?

$3[(x^2 - 1x) + (6x - 6)]$

$3[x(x-1) + 6(x-1)]$

$\boxed{3[(x-1)(x+6)]}$ Completely FACTORED

Homework: Pg 751 # 1, 4, 7, 10, 13, 16, 19, 22, 25, & 28 (1st column)