

Name: _____

Date: _____

Class/Home worksheet: Alg2H
Factoring (book chapter 5, page 519 and beyond)

Factoring is the reverse of multiplying.

Factoring an expression means to write it as an equivalent expression that is a product.

Common factor:

$$3x^2 + 12 =$$

Common factor:

$$7x^3 + 14x^2 =$$

Common factor:

$$5x^3 - 20x^3 =$$

Common factor:

$$12x^2y - 20x^3y =$$

Common factor:

$$10a^4 + 15a^2 - 25a =$$

Common factor:

$$9x^3y^2 - 6x^2y^3 + 3x^3y^3 =$$

Take a common factor if possible.
It will simplify things!

Difference of Squares (P. 221)

$$A^2 - B^2 = (A + B) \cdot (A - B)$$

Factor:

$$x^2 - 25 =$$

Factor:

$$9x^2 - 16y^2 =$$

Factor:

$$\frac{1}{25} - x^2 =$$

Factor (challenge):

$$x^{16} - 1 =$$

Perfect Squares (P. 220)

$$A^2 + 2AB + B^2 = (A + B)^2$$

$$A^2 - 2AB + B^2 = (A - B)^2$$

Factor:

$$x^2 + 10x + 25 =$$

Factor:

$$x^2 - 14x + 49 =$$

Factor (hint: rearrange) :

$$16y^2 + 49 + 56y =$$

Factor:

$$72xy + 16x^2 + 81y^2 =$$

Factoring trinomials MATH style

(The common method in Kehillah school!)

Assume a trinomial of the form

$$aX^2 + bX + c$$

Create the following table following the directions below it:

M	A	T	H
$a \cdot c \cdot X^2$	$b \cdot X$	Try the various factors of $a \cdot c$ that sum up to b	☺

1. Put under M (Multiply) the product $a \cdot c \cdot X^2$
2. Put under A (Add) the value of $b \cdot X$
3. Under T (Tries), put the various factor-pairs of the result in M, and try to see if their sum adds up to A.
4. When you find an appropriate pair, mark a smiley face in H (Happy) !
5. Rewrite the trinomial, by writing the middle term as the sum of two terms, and factor by grouping appropriate terms.

Examples:

I. $3x^2 + 8x + 4$

M	A	T	H

II. $2x^2 + x - 15$

M	A	T	H

III. $x^2 - 2x - 24$

M	A	T	H

Let's try in the case of binomial (though we know the answer already!)

IV. $4x^2 - 9 = 4x^2 + 0x - 9$

M	A	T	H

V. $-2x^2 - x + 6$

M	A	T	H

From the book, Page 223

<p>(30) $12a^2 + 36a + 27 =$</p>	<p>(38) $9x^2 - 25 =$</p>
<p>(46) (tricky: Don't stop in the middle)</p> <p>$4xy^4 - 4xz^4 =$</p>	<p>Factor:</p> <p>$x^2 + 9x + 20 =$</p>
<p>Factor:</p> <p>$4x^2 - 3 + 4x =$</p>	<p>Factor:</p> <p>$6x^2 + 17x + 7 =$</p>

Two more items for factoring: Grouping and Cubes