

MANIUPATING QUADRATIC EXPRESSIONS – TEST REVIEW #4

1. Expand and simplify the following:

$$\text{a) } (x+3)(x+6) \text{ FOIL!}$$

$$= x^2 + 6x + 3x + 18$$

$$= x^2 + 9x + 18$$

$$\text{b) } (x-2)(x+4)$$

$$= x^2 + 4x - 2x - 8$$

$$= x^2 + 2x - 8$$

$$\text{c) } (4x-3)(3x+2)$$

$$= 12x^2 + 8x - 9x - 6$$

$$= 12x^2 - x - 6$$

2. Factor the following algebraic expressions using the Common Factoring method.

$$\text{a) } 7x + 21$$

$$= 7(x+3)$$

$$\text{b) } x^3 - 4x^2$$

$$= x^2(x-4)$$

$$\text{c) } 8x^2 - 24x + 12$$

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

$$\text{d) } 3x^2 - 9x + 12$$

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

3. Factor the following using the Trinomial Method (double brackets).

$$\text{a) } x^2 + 11x + 24$$

$$= (x+3)(x+8)$$

$$\text{b) } x^2 - 8x + 16$$

$$= (x-4)(x-4)$$

$$\text{c) } x^2 - 6x + 5$$

$$= (x-1)(x-5)$$

$$\text{d) } x^2 - 3x - 10$$

$$= (x-5)(x+2)$$

4. Factoring the following using the Difference of Squares method.

a) $x^2 - 16$

$= (x+4)(x-4)$

b) $9y^2 - 25$

$= (3y+5)(3y-5)$

c) $100 - x^2$

$= (10+x)(10-x)$

d) $3x^2 - 27$

$= 3(x^2 - 9)$
 $= 3(x+3)(x-3)$

common factor 3!

5. Factor the following quadratics using common factoring, difference of squares, OR the trinomial method. **CHECK BY EXPANDING YOUR ANSWERS.**

a) $3x^2 + 6x$

common

$= 3x(x+2)$

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

trinomial

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

check

$3x^2 + 6x \checkmark$

check

$x^2 - 3x - 3x + 9$
 $= x^2 - 6x + 9 \checkmark$

c) $144 - 4x^2$

Diff. of squares

$= (12-2x)(12+2x)$

d) $x^2 - 2x - 48$

trinomial

$= (x-8)(x+6)$

check

$144 + 24x - 24x - 4x^2$
 $= 144 - 4x^2 \checkmark$

check

$x^2 + 6x - 8x - 48$
 $= x^2 - 2x - 48 \checkmark$

6. **SOLVE** the following by factoring.

a) $x^2 + 3x - 28 = 0$

b) $x^2 + 6x = 0$

c) $x^2 - 9 = 0$

Factor

$(x+7)(x-4) = 0$

$x+7=0$ $x-4=0$

$x = -7$ $x = 4$

$\therefore x = -7$ OR $x = 4$

Factor

$x(x+6) = 0$

$x = 0$ $x+6=0$

$x = -6$

$\therefore x = 0$ OR $x = -6$

$x+3=0$ $x-3=0$

$x = -3$ $x = 3$

$\therefore x = -3$ OR $x = 3$

7. A farmer's field has the following area.

a) Find the expressions for the dimensions of the field by factoring.

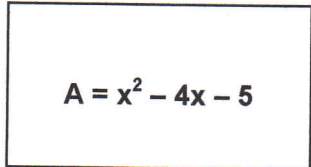
$x^2 - 4x - 5$

$= (x-5)(x+1)$

\therefore width = $(x-5)$

length = $(x+1)$

trinomial!



b) Determine the dimensions (length and width) if $x = 12$.

$x = 12$

width = $12 - 5 = 7$

length = $12 + 1 = 13$

\therefore width is 7 and length is 13.