Agenda

Take up homework from Wednesday

Quiz Thursday - This unit so far

Factoring

Hmwk

Homework from Wednesday - pg. 29 # 2-4

2. g) $y = 2x^2 - 3x + 5$ y-intercept (0,5)
direction of opening - up
step pattern - 2, 6, 10

d) $y = -3x^2 - 5x + 2$ y-intercept (0,2)
direction of opening - down
step pattern : -3, -9, -15

3. a) $y = (x - 2)(x + 4)$ x - intercepts: 2, -4
direction of opening: up
step pattern: 1, 3, 5
vertex : ~~(-2, -8)~~ (-1, -9)
re-write in standard form: $y = x^2 + 2x - 8$
y - intercept: (0, -8)

e) $y = 2(x - 1)(x + 3)$ x - intercepts: 1, -3
direction of opening: up
step pattern: 2, 6, 10
vertex : (-1, -8)
re-write in standard form: $y = 2x^2 + 4x - 6$
y - intercept: (0, -6)

f) $y = -2(x + 3)(x - 2)$ x - intercepts: -3, 2
direction of opening: down
step pattern: -2, -6, -10
vertex : (-0.5, 12.5)
re-write in standard form: $y = -2x^2 - 2x + 12$
y - intercept: (0, -6)

h) $y = 2(x - 3)(x + 3)$ x - intercepts: 3, -3
direction of opening: up
step pattern: 2, 6, 10
vertex : (0, -18)
re-write in standard form: $y = 2x^2 - 18$
y - intercept: (0, -18)

#4 c) $y = 3(x + 5)^2 - 15$ vertex: (-5, -15)
direction of opening: up
step pattern: 3, 9, 15
standard form: $y = 3x^2 + 30x + 60$
y - intercept: (0, 60)

b) $y = 2(x - 1)^2 + 1$ vertex: (1, 1)
direction of opening: up
step pattern: 2, 6, 10
standard form: $y = 2x^2 - 4x + 3$
y - intercept: (0, 3)

3 Forms of a Quadratic

1) Vertex $y = a(x-h)^2 + k$

2) Factored $y = a(x-s)(x-t)$

3) Standard $y = ax^2 + bx + c$

y intercept.

Review of last Class

Expand the following 2 questions and determine the y-intercept:

a) $y = -(x-1)^2 + 5$

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

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

$= -x^2 + x + x - 1 + 5$

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

y - intercept: $(0, 4)$

$y = ax^2 + bx + c$

b) $y = 2(x+1)(x+7)$

$= (2x+2)(x+7)$

$= 2x^2 + 14x + 2x + 14$

$= 2x^2 + 16x + 14$

y - intercept: $(0, 14)$

Factoring

Expanding →
$2(x + 3) = 2x + 6$
← Factoring

1. Common Factoring

- divide out a common factor

1st step of turning standard into factored form

a) $4x - 8$

$= 4\left(\frac{4x}{4} - \frac{8}{4}\right)$

$= 4(x - 2)$

b) $5x^2 - 15x + 20$

$= 5\left(\frac{5x^2}{5} - \frac{15x}{5} + \frac{20}{5}\right)$

$= 5(x^2 - 3x + 4)$

c) $-3x^2 + 18x - 24$

$= -3\left(\frac{-3x^2}{-3} + \frac{18x}{-3} - \frac{24}{-3}\right)$

$= -3(x^2 - 6x + 8)$

d) $24x^2 - 15x + 27$

$= 3\left(\frac{24x^2}{3} - \frac{15x}{3} + \frac{27}{3}\right)$

$= 3(8x^2 - 5x + 9)$

Factoring: Product Sum Rule

Factor the following

$y = ax^2 + bx + c$

Ex.1 $x^2 + 5x + 6$

$y = (x + 2)(x + 3)$

Product (x) 6	Sum (+) 5
$(2)(3) = 6$	$2 + 3 = 5$

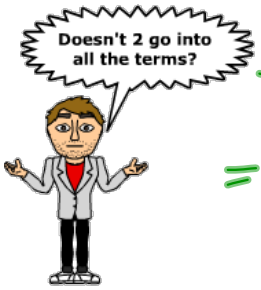
$y = a(x - s)(x - t)$

Ex.2 $w^2 + 2w - 15$

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

Product (x) -15	Sum (+) 2
$(-3)(5) = -15$	$(-3 + 5) = 2$

Ex.3 $2y^2 + 4y - 48$



Product (x) -24	Sum (+) $+2$
$(6)(-4) = -24$	$6 - 4 = 2$

$= 2\left(\frac{2y^2}{2} + \frac{4y}{2} - \frac{48}{2}\right)$

$= 2(y^2 + 2y - 24)$

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

Factoring: Product Sum Rule

Ex.4 $2x^2 - 4x + 2$

Ex.5 $w^2 - 13w + 42$

Ex.6 $3x^2 - 12x + 12$

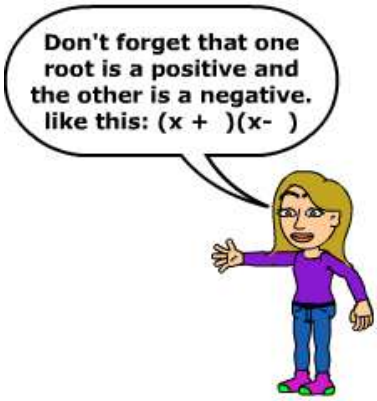
Factoring: Product Sum Rule

What is a perfect square?

Difference of Squares: an expression that represents subtraction between two perfect squares

1. $x^2 - 9$

2. $x^2 - 25$



3. $x^2 - 100$

4. $3x^2 - 12$

Changing to Factored Form

Change the following to factored form and state the x-intercepts, the y-intercept, and the vertex.

a) $y = x^2 + 5x + 6$

Prod. 6 | Sum 5

$(2)(3) = 6$ | $2 + 3 = 5$

$= (x + 2)(x + 3)$

x - intercepts $-2, -3$

y - intercept $(0, 6)$

~~vertex~~

b) $y = 2x^2 - 18x + 40$

x - intercepts $4, 5$

$= 2\left(\frac{2x^2}{2} - \frac{18x}{2} + \frac{40}{2}\right)$

y - intercept $(0, 20)$

$= 2(x^2 - 9x + 20)$

vertex

Prod. 20 | Sum -9

$(-4)(-5) = 20$ | $(-4) + (-5) = -9$

$= 2(x - 4)(x - 5)$

Homework

pg 30 #1 (LS), #2 a & b

pg 31 #1 a,g,m,s

#2 a,d,g,j,m

pg 30 #1 LS

#2 all