

## Quadratic Relations Strand Expectations:

- 1) determine the basic properties of quadratic relations
- 2) relate transformations of the graph of  $y = x^2$   
to the algebraic representation  $y = a(x - h)^2 + k$
- 3) solve quadratic equations and interpret the solutions  
with respect to the corresponding relations
- 4) solve problems involving quadratic relations

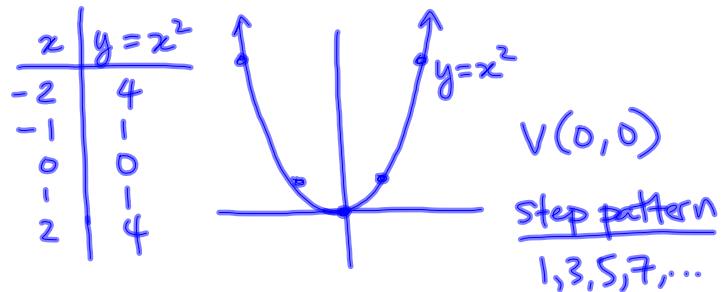
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## Quadratic Relations Expectations: Jan 11/2012

- 1) determine the basic properties of quadratic relations
  - 2nd differences constant
  - equations:  $y = a(x-h)^2 + k$   
 $y = ax^2 + bx + c$   
 $y = a(x-s)(x-t)$
  - direction of opening, min/max,  
 vertex  $(h,k)$ ,  $y\text{-int} = c$ ,  
 zeroes:  $x=s$  and  $x=t$
  - axis of symmetry:  $x = \frac{s+t}{2}$   
 or  $x = h$
  - graph is a parabola

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2) relate transformations of the graph of  $y = x^2$  to the algebraic representation  $y = a(x-h)^2 + k$



$$y = a(x-h)^2 + k \quad V(h, k)$$

Step : (1, 3, 5, 7, ...)  $\times a$

a: ① vertical reflection

② v. stretch or compression

h: ③ horizontal shift (left or right)

k: ④ vertical shift (up or down)

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3) solve quadratic equations and interpret the solutions with respect to the corresponding relations

① solve

- usually looking for zeros

- sometimes a specific y-value.

→ rearrange equation so one side is zero

$$ax^2 + bx + c = 0$$

factor

$$a(x-s)(x-t) = 0$$

$$x=s \text{ or } x=t$$

quadratic formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

0, 1, or 2 solutions

→ check using  $D = b^2 - 4ac$

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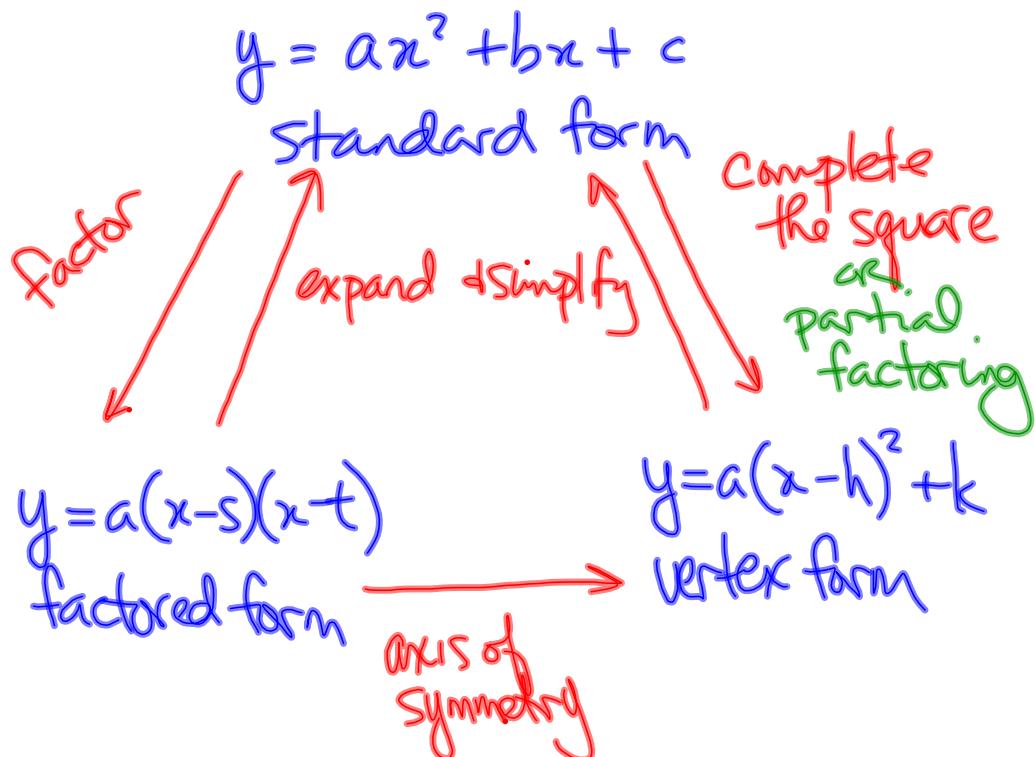
4) solve problems involving quadratic relations

- usually word problem
- do we want : ① zeroes ?  
② vertex ?

$$\text{Revenue} = (\# \text{ sold})(\text{price})$$

→ break even when profit = 0

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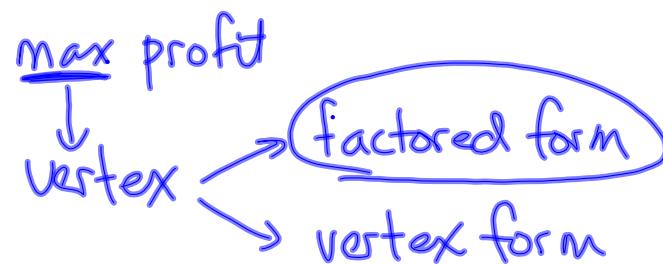
Assigned work for Wednesday - Friday:

p.190 # 16 - 22

p.365 # 1 - 25

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P. 190  
19.  $P = (-6x + 78)(x + 3)$



Set  $P=0$

$$0 = (-6x + 78)(x + 3)$$

$$-6x + 78 = 0 \quad \text{or} \quad x + 3 = 0$$

Jan 12-10:47 AM