

Ch. 4. Review :

4.1, 4.2  
Mon.

Quadratic Equations

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

$(h, k)$   
 $x = h$

$a > 0 \uparrow$  min  
 $a < 0 \downarrow$  max

$k$

ARN

$\uparrow y \geq k$   
 $\downarrow y \leq k$

plug in  $x=0$ , solve for  $y$ .

Standard Form

$y = ax^2 + bx + c$

vertex  $(-\frac{b}{2a}, f(-\frac{b}{2a}))$   
aos  $x = -\frac{b}{2a}$

max/min

$a > 0 \uparrow$  min  
 $a < 0 \downarrow$  max

$f(-\frac{b}{2a})$

ARN

Domain

Range

$\uparrow y \geq f(-\frac{b}{2a})$   
 $\downarrow y \leq f(-\frac{b}{2a})$   
 $c$

$y$ -int

vertex:  $y = a(x-h)^2 + k$   
 $(h, k)$

pt:  $(x, y)$   
 $y = a(x-h)^2 + k$   
Solve for  $a$ .  
Replace  $a, h, k$ .

To write AE

$(6, -3)$  ✓  
 $v: (4, 0)$  ✓  
 $y = a(x-h)^2$   
 $v: (, 0)$

Given 3 points. 4.3  
Plug in  $(x, y)$  into  
 $y = ax^2 + bx + c$   
3 times.

Solve the system.

Inequalities

①  $\leq \geq$  solid boundary  
 $< >$  dashed boundary

② Shade  $y >, \geq$  above  
 $y <, \leq$  below

(or test a pt, such as  $(0, 0)$ )

## Solving Quadratic Equations 4.4-4.5

4.4 ① Factor

4.5

( ) ( ) = 0 (A) GCF

( ) = 0 ( ) = 0 (B) Perfect Squares

Zero Product  
Property

$$a^2 - b^2 = (a+b)(a-b)$$

$$a^2 + 2ab + b^2 = (a+b)^2$$

(C) Guess &amp; Check / a.c method / table

4.6 ② Complete the Square

$$x^2 + bx + c = 0 \quad b \rightarrow \text{even}$$

$$x^2 + bx + \left(\frac{b}{2}\right)^2 = -c + \left(\frac{b}{2}\right)^2$$

$$y = (x^2 + bx + \frac{b}{2}) + c - \left(\frac{b}{2}\right)^2 \quad \left(x + \frac{b}{2}\right)^2 = \underline{\hspace{2cm}}$$

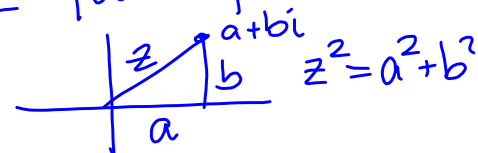
4.7 ③ Quadratic Formula  $ax^2 + bx + c = 0$ 

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

4.8 Complex Numbers  $\rightarrow a + bi$ 

$$*(a^2 + b^2) = (a + bi)(a - bi) \quad (x^2 + 25) \quad (x + 5i)(x - 5i)$$

$$i^2 = \boxed{-1}, \quad \boxed{i} = \sqrt{-1}$$

$$\frac{3}{(6+7i)} \cdot \frac{(6-7i)}{(6-7i)} \quad z = |a+bi| = \sqrt{a^2+b^2}$$


$$z^2 = a^2 + b^2$$

4.9 Systems of Equations / Inequalities