#### **Domain and Range**

Domain:

Range:

1) The function  $f(x) = 2x^2 + 7x + 1$  has a domain consisting of integers from -1 to 1, inclusive. What is the set of corresponding range values for f(x)?

2) The function  $f(x) = x^2 - 5$  has the domain {0, 3, 6}, what is the range?

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

\*Discriminant

$$b^2 - 4ac$$

- 1) What is the discriminant of  $r^2 + 3r 70 = 0$
- 2) What are the roots of  $r^2 + 3r 70 = 0$

#### **<u>8.3Completing the square</u>**

Solve the following by completing the square:

$$x^2 + 2x - 15 = -7 \qquad p^2 - 10p + 30 = 9$$

#### 8.6 Getting Quadratic Functions into vertex form

 $y = x^2 - 6x + 5$ 

 $y = x^2 + 4x + 2$ 



8.7 (Transformations)	
Vertex Form	Vertex
$f(x) = a(x \pm h)^2 + k$	(Opposite of h, k)
<b>k</b> tells us move up (positive) or move down (negative)	

h tells us move left (positive) or right (negative)

**a** tells us if the graph is narrow a>1 or a<-1 (whole number integer)

**a** tells us if the graph is wider  $0 \le a \le 1$  or  $-1 \le a \le 0$  (fraction)

a tells us if the graph is facing upward (positive) or downward (negative)

#### 1) What are the movements of these graphs?

 $f(x) = 4(x+2)^2 + 1 \qquad \qquad f(x) = \frac{1}{2}x^2 - 2$ 

#### $h(t)=-16t^{2}+vt+h$

#### 8.11 max/min problems

- h(t) represents the projectile's height at any time t
- v represents initial velocity
- h represents the initial height from which the projectile is released
- t represents time in seconds after the projectile is released

1) A ball is thrown from a bridge. The height of the ball is modeled by the function  $h(t) = -16t^2 + 48t + 8$ . Determine the time it will take for the ball to hit the ground.

2) A ball is thrown directly upward from an initial height of 200 feet with an initial velocity of 96 feet per second. After how many seconds will the ball reach its maximum height? What is the maximum height?

### $h(t)=-16t^2 + vt + h$

- h(t) represents the projectile's height at any time t
- v represents initial velocity
- h represents the initial height from which the projectile is released
- t represents time in seconds after the projectile is released