

## 5.3B Number and Type of Solutions: Part II

1.  $y = x^2 - 2x - 8$

a) What is the discriminant?

$$b^2 - 4ac = (-2)^2 - 4(1)(-8)$$

$$= 4 + 32$$

$$= \boxed{36}$$

b) Number of solutions? 2

c) Type of solutions? real, rational

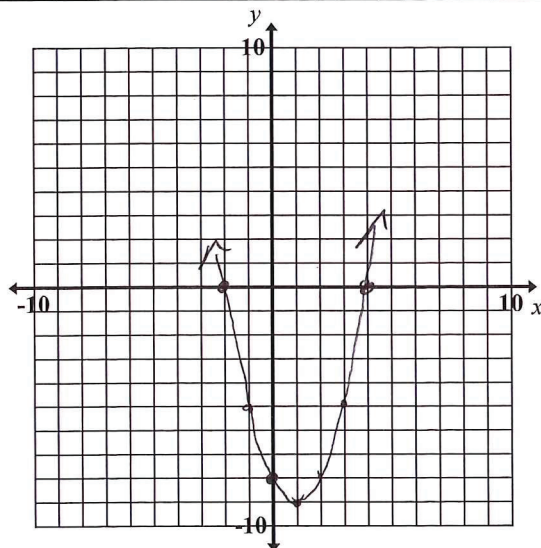
d) What are the zeros (roots)?  $x = -2$ 

\*Factor or use the graph  $x = 4$

$$(x+2)(x-4) = 0$$

e) Graph the equation.

x	-2	-1	0	1	2	4
y	0	-5	-8	-9	-8	0

f) What is the vertex?  $(1, -9)$ 

g) Is the vertex a minimum or maximum?

h) What is the y-intercept?  $(0, -8)$ 

i) What is the domain? all real numbers

j) What is the range?  $y \geq -9$ 

2.  $y = 9 - x^2$

a) What is the discriminant?  $-x^2 + 9 = 0$ 

$$b^2 - 4ac = (0)^2 - 4(-1)(9)$$

$$= 0 + 36$$

$$= \boxed{36}$$

b) Number of solutions? 2

c) Type of solutions? real rational

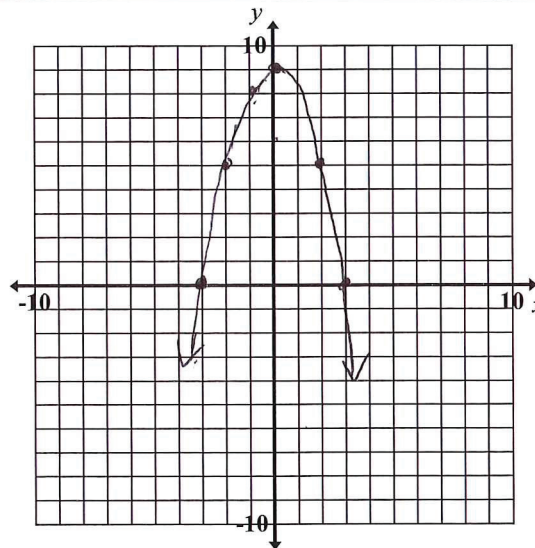
d) What are the zeros (roots)?  $-1(x^2 - 9) = 0$ 

\*Factor or use the graph  $x^2 - 9 = 0$

$$x = -3, x = 3 \quad (x+3)(x-3) = 0$$

e) Graph the equation.

x	-3	-2	-1	0	2	3
y	0	5	8	9	5	0

f) What is the vertex?  $(0, 9)$ 

g) Is the vertex a minimum or maximum?

h) What is the y-intercept?  $(0, 9)$ 

i) What is the domain? all reals

j) What is the range?  $y \leq 9$

### 5.3B Number and Type of Solutions: Part II

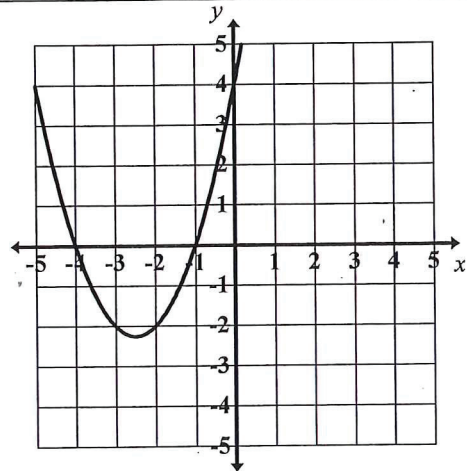
3. Which equation *could* model the graph to the right?

[A]  $y = -(x-4)(x-1)$

[B]  $y = -(x+4)(x+1)$

[C]  $y = (x-4)(x-1)$

[D]  $y = (x+4)(x+1)$   $x = -4$  or  $x = -1$   
 $0 = (x+4)(x+1)$



- #4 – 6: Find the discriminant of each equation and then state the number and type of solutions.

4.  $x^2 + 6x = -2$   $(6)^2 - 4(1)(2)$   
 $x^2 + 6x + 2 = 0$   $36 - 8$   
discriminant: 28

number of solutions: 2

real or imaginary: real, irr

5.  $2x^2 - 8x = -8$   $(-4)^2 - 4(1)(4)$   
 $x^2 - 4x + 4 = 0$   $16 - 16$   
discriminant: 0

number of solutions: 1

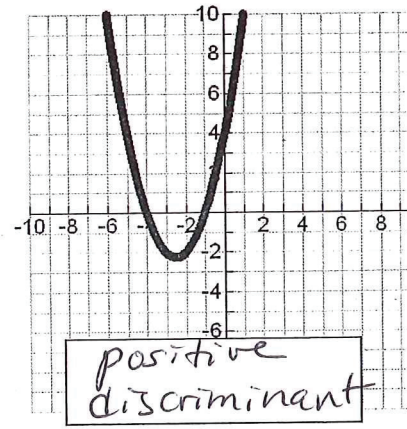
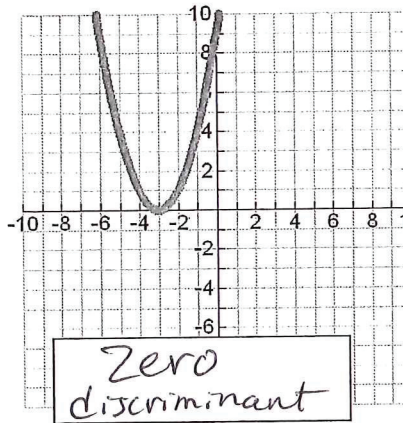
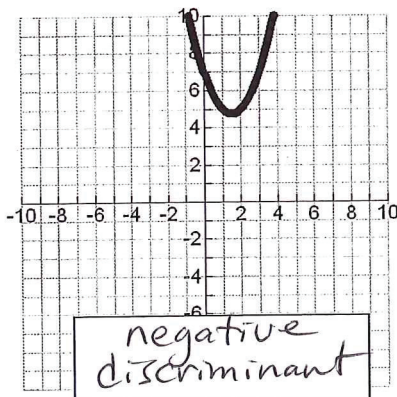
real or imaginary: real, rational

6.  $5x^2 - 13x + 9 = 0$   $(-13)^2 - 4(5)(9)$   
 $169 - 180$   
discriminant: -11

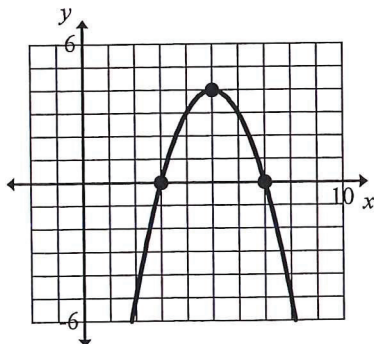
number of solutions: 2

real or imaginary: imaginary

7. Label each graph below as having a **positive**, **negative**, or **zero** discriminant.



8. What type of discriminant does the graph have? How many solutions does the graph have? Write a possible equation to model the graph pictured to the right.



Discriminant a positive perfect square number

Type and number of solutions 2 real rational

A possible equation  $y = -(x-3)(x-7)$   
or  
 $y = -(x^2 - 10x + 21)$   
 $y = -x^2 + 10x - 21$

Section 5.3B