$b^2 - 4ac$

5.3 A/B Worksheet Name: Key Period: ______

Identify values for "a", "b", and "c". Find the discriminant of the quadratic equation. Then identify how many solutions and what type of solutions the discriminant will give.

1. $x^2 - 2x + 1 = 0$

$a = 1 \quad b = -2 \quad c = 1$

$(-2)^2 - 4(1)(1) = 0$

Discriminant: 0
Number of solutions: 1
Type of solutions: Real and rational

2. $4x^2 + 12x + 9 = 0$

$a = 4 \quad b = 12 \quad c = 9$

$(12)^2 - 4(4)(9) = 144 - 144$

Discriminant: 0
Number of solutions: 1
Type of solutions: Real and rational

3. $x^2 + 4 = 3$

$-3 \quad -3$

$x^2 + 0x + 1 = 0$

$a = 1 \quad b = 0 \quad c = 1$

$(0)^2 - 4(1)(1) = -4$

Discriminant: -4
Number of solutions: 2
Type of solutions: complex

4. $x^2 - 14 = 15x$

$-15x \quad -15x$

$x^2 - 15x - 14 = 0$

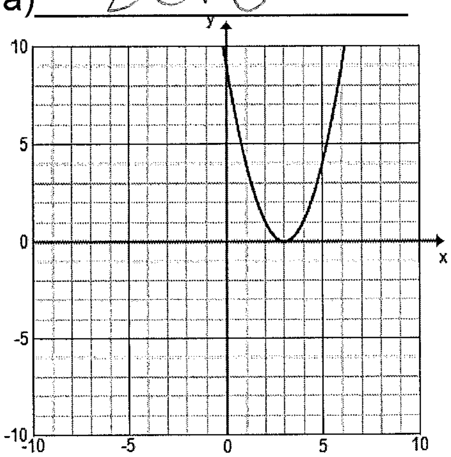
$a = 1 \quad b = -15 \quad c = -14$

$(-15)^2 - 4(1)(-14) = 281$

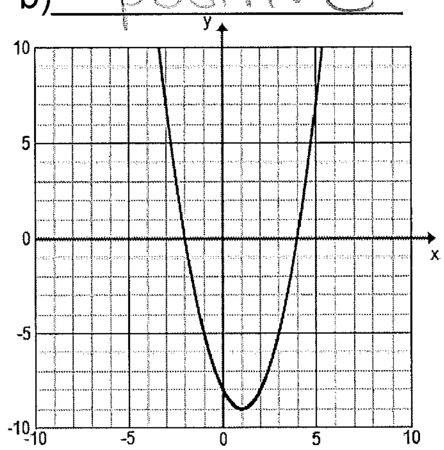
Discriminant: 281
Number of solutions: 2
Type of solutions: real and irrational

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

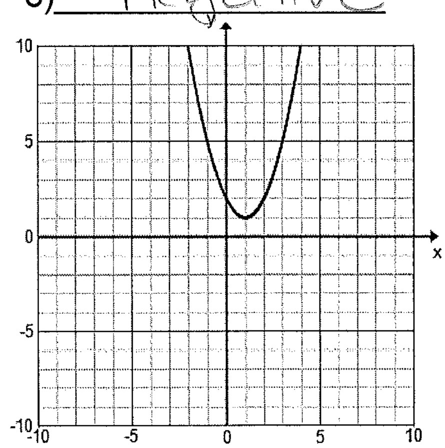
a) zero



b) positive

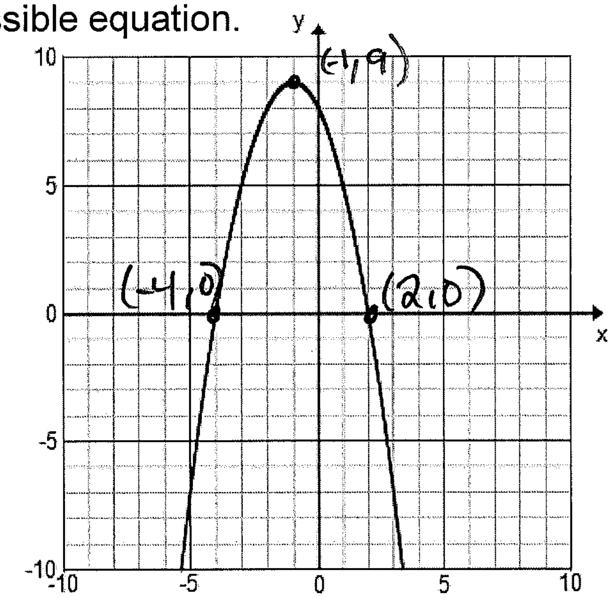


c) negative



For problems 6-9, label the discriminant, number and type of solutions, and the possible equation.

6.



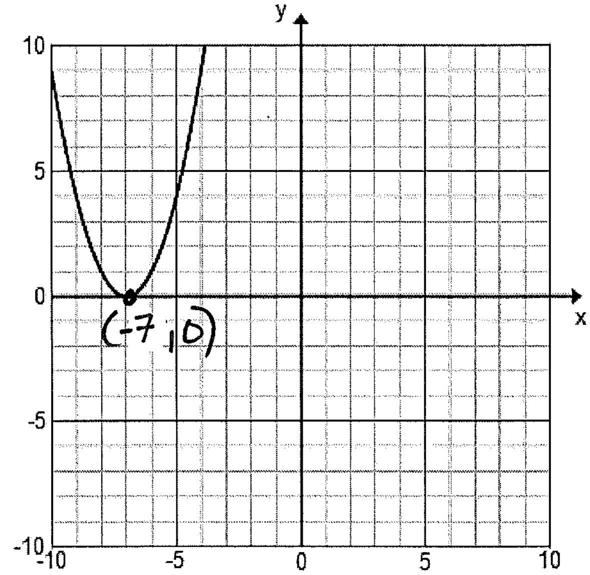
Discriminant: positive

Number of solutions: 2

Type of solutions: rational

Possible Equation: $y = -1(x+4)(x-2)$
$= -x^2 - 2x + 8$

8.



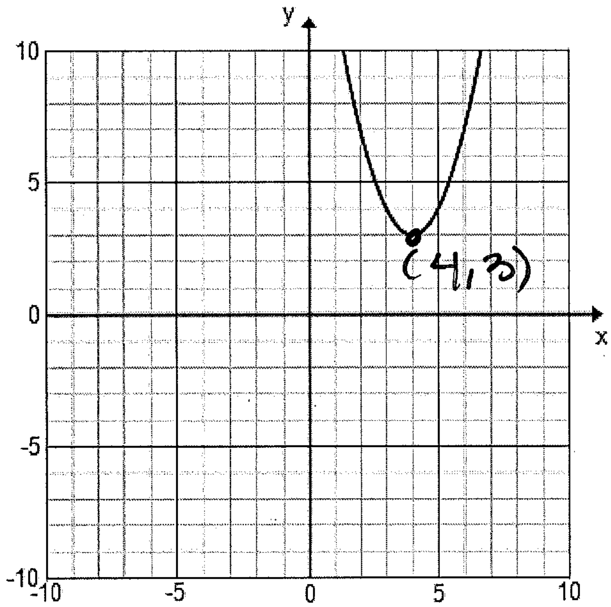
Discriminant: zero

Number of solutions: 1

Type of solutions: rational

Possible Equation: $y = (x+7)^2 + 0$
$y = x^2 + 14x + 49$

7.



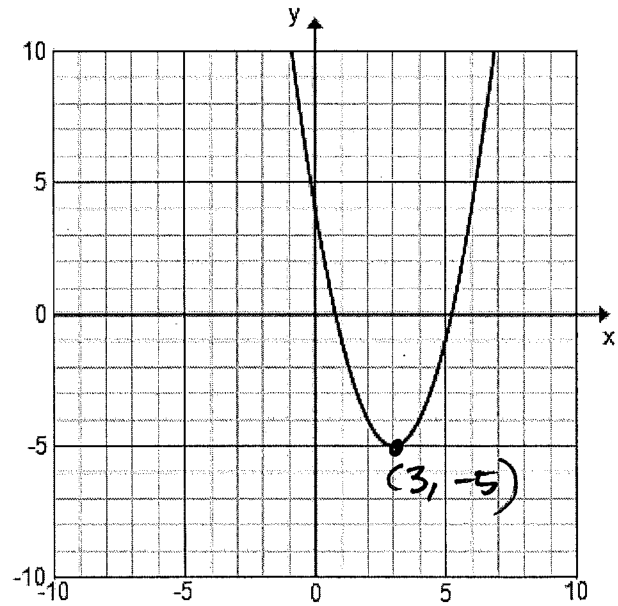
Discriminant: negative

Number of solutions: 2

Type of solutions: Complex

Possible Equation: $y = (x-4)^2 + 3$
$= x^2 - 8x + 19$

9.



Discriminant: positive

Number of solutions: 2

Type of solutions: irrational

Possible Equation: $y = (x-3)^2 - 5$
$= x^2 - 6x + 4$