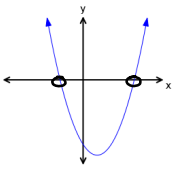
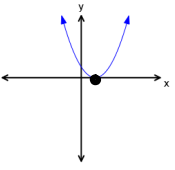
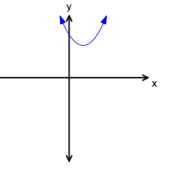


Math 2200 Nature of Roots and The Discriminant

Discriminant of a Quadratic Equation

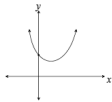
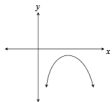
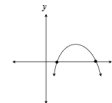
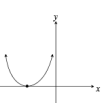
The number $D = b^2 - 4ac$ is determined from the coefficients of the equation $ax^2 + bx + c = 0$. The discriminant reveals what type of roots the equation has.

Case 1.: $D > 0$	Case 2.: $D = 0$	Case 3.: $D < 0$
Graphically:	Graphically:	Graphically:
		
Description: 2 Real and Distinct	Description: 1 Real	Description: 0 Real

1. What is the value of the discriminant for each?

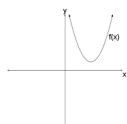
<p>a. $x^2 + 3x - 2 = 0$</p> <p>$d = b^2 - 4ac$ $= (3)^2 - 4(1)(-2)$ $= 9 + 8$</p>	<p>b. $2x^2 - 1x + 2 = 0$</p> <p>$d = -15$</p>	<p>c. $x^2 - 4x + 4 = 0$</p> <p>$d = 0$</p>
<p>d. $\sqrt{2}x + 3 = x^2$</p> <p>$0 = x^2 - \sqrt{2}x + 3$</p> <p>$a = (-\sqrt{2})^2 - 4(1)(3)$ $= 2 + 12$ $= 14$</p>	<p>e. $2x^2 = 4x - 1$</p> <p>$2x^2 - 4x + 1 = 0$</p> <p>$(-4)^2 - 4(2)(1)$ $16 - 8$ $= 8$</p>	<p>f. $(x+2)^2 - 1 = 0$</p> <p>$x^2 + 4x + 4 - 1 = 0$ $x^2 + 4x + 3 = 0$</p> <p>$4^2 - 4(1)(3)$ $16 - 12 = 4$</p>

2. A quadratic equation $f(x) = 0$ has a discriminant of 20. Which best represents the graph of $f(x)$?

(A) 	(B) 
(C) 	(D) 

3. The graph of a quadratic function $f(x)$ is shown. Which could be the value of the discriminant of the equation $f(x) = 0$?

(A) -5 (B) 0 (C) 4 (D) 6



4. A quadratic function $f(x)$ has vertex $(2, -4)$ and opens downward. What is a possible value of the discriminant for the equation $f(x) = 0$?

(A) -3 (B) 0 (C) 3 (D) 3i

5. For each equation, describe the roots

a. $x^2 + 3x - 1 = 0$	b. $2x^2 - 2x + 5 = 0$	c. $x^2 - 4x = 0$
-----------------------	------------------------	-------------------

$d =$ $d =$ $d =$

Bye Sir

$$x^2 + 3x + 2 = 0$$

Nov 28-2:35 PM