9.6 cont'd Day (2)

* Review Problem 3 on pg. 585 &
  Got it #3

* <u>Dis</u>crimin<u>ant</u> – expression under the
  radical sign in the quadratic
  formula
  - helps you determine if the
    quadratic equation has one, two or
    no real # solutions
  - can be positive, zero or negative

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

* If the discriminant is...

  • positive, there are two real # solutions ⟹
  • negative, there are no real # solutions
  • zero, there is one real # solution

* Review the chart on pg. 585

* Review Problem 4 on pg. 586

* Got it # 4a) $6x^2 - 5x = 7$

$6x^2 - 5x - 7 = 0$

$b^2 - 4ac$

$(-5)^2 - 4(6)(-7)$

$25 + 168$

193 since the discriminat is positive there are 2 solutions

B) $b^2 - 4ac$

$b^2 - 4(a)(-c)$

$b^2 + 4a$

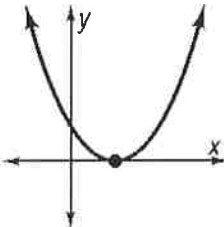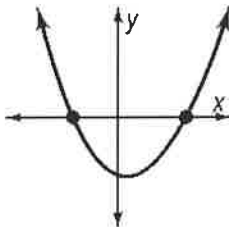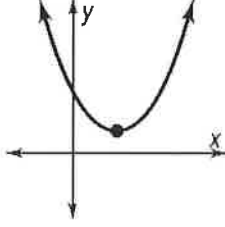* must be a positive #, therefore 2 solutions because the square root of a positive has two solution

* A negative discriminat has no solution because you cannot find the square root of a negative.

* A zero discriminat only has one solution because the square root of zero will only yield one answer.

Name _____ Class _____ Date _____

9-6 Enrichment

The Quadratic Formula and the Discriminant

You have used the discriminant to find the number of solutions to a quadratic equation. You can also use the discriminant to determine the number of x-intercepts of the graph of the related function.

Discriminant	Positive Discriminant $b^2 - 4ac > 0$	Discriminant is Zero $b^2 - 4ac = 0$	Negative Discriminant $b^2 - 4ac < 0$
Example			
Number of x-intercepts of graph of related function	The graph has two x-intercepts.	The graph has one x-intercept.	The graph has no x-intercepts.

Practice

Use the discriminant of the related quadratic equation to determine the number of x-intercepts of the graph of the function.

1. $y = x^2 + 4x + 5$

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

3. $y = x^2 - 2x + 1$

4. $y = x^2 - 4x + 13$

5. $y = 2x^2 + 11x - 5$
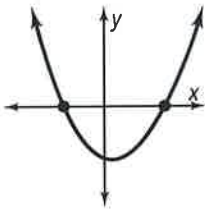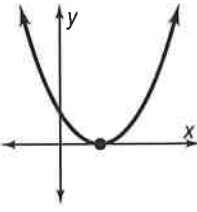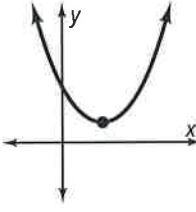
6. $y = 4x^2 - 17x - 15$

7. $y = x^2 - 9x$

8. $y = 3x^2 - 7x + 5$

9-6

Enrichment

The Quadratic Formula and the Discriminant

You have used the discriminant to find the number of solutions to a quadratic equation. You can also use the discriminant to determine the number of x-intercepts of the graph of the related function.

Discriminant	Positive Discriminant $b^2 - 4ac > 0$	Discriminant is Zero $b^2 - 4ac = 0$	Negative Discriminant $b^2 - 4ac < 0$
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Practice

Use the discriminant of the related quadratic equation to determine the number of x-intercepts of the graph of the function.

1. $y = x^2 + 4x + 5$ negative, none $b^2 - 4ac$ $16 - 4(1)(5)$ $16 - 20$

2. $y = x^2 - x - 2$ two, positive $b^2 - 4ac$ $(-1)^2 - 4(1)(-2)$ $1 + 8$

3. $y = x^2 - 2x + 1$ one, zero $b^2 - 4ac$ $-2^2 - 4(1)(1)$ $4 - 4 = 0$

4. $y = x^2 - 4x + 13$ none, negative $b^2 - 4ac$ $(4)^2 - 4(1)(13)$ $16 - 52$

5. $y = 2x^2 + 11x - 5$ two, positive $b^2 - 4ac$ $11^2 - 4(2)(-5)$ $121 + 40$

6. $y = 4x^2 - 17x - 15$ two, positive $b^2 - 4ac$ $(-17)^2 - 4(4)(-15)$ $289 + 240$

7. $y = x^2 - 9x$ two, positive $b^2 - 4ac$ $(-9)^2 - 4(1)(0)$ $81 - 0$ 81

8. $y = 3x^2 - 7x + 5$ none, negative $b^2 - 4ac$ $(-7)^2 - 4(3)(5)$ $49 - 4(3)(5)$ $49 - 60$