

WEBASSIGN DUE NEXT WEDNESDAY.

TEST NEXT TUESDAY/WEDNESDAY 7:30 BRING } CALCULATION  
 REVIEW TEST MONDAY, NO CLASS TOMORROW } SCANTRON  
} NOTES

Discriminant:  $b^2 - 4ac$  from the quadratic formula.

- To solve  $ax^2 + bx + c = 0$  e.g.  $x^2 + 6x + 9 = 0$

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

(1) solve it

(2) discriminant

$$(x+3)(x+3) = 0$$

$$b^2 - 4ac = 6^2 - 4(1)(9)$$

$$x = -3 \quad x = -3$$

$$= 36 - 36$$

$$= 0$$

- The discriminant is

(1) positive, then the quadratic equation has 2 distinct real roots

(2) zero, then " " " " has 1 real solution repeated

↳ the polynomial is a perfect square (factors into identical factors)

(3) negative, then the quadratic equation has zero real solutions.

e.g.  $2x^2 + 15 = 0$ ,

$a = 2$

discriminant:

$b = 0$

$$b^2 - 4ac = 0^2 - 4(2)(15) \quad c = 15$$

$$= 0 - 120$$

$$= -120 < 0$$

therefore there is no real number solutions.

WEBASSIGN PRACTICE

1.4-9 Use the discriminant to determine the number of real # solution.

$$8 + 2.5x - 8.8x^2 = 0.$$

standard form:  $-8.8x^2 + 2.5x + 8 = 0$

$a = -8.8$

$b = 2.5$

discriminant:  $b^2 - 4ac = 2.5^2 - 4(-8.8)(8) \quad c = 8$

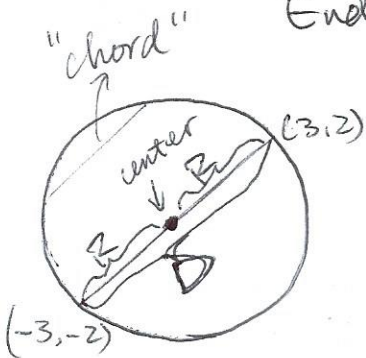
$$= 6.25 + 281.6 = \boxed{287.85} > 0 \Rightarrow$$

Since the discriminant is positive, so there are two distinct real roots TWO REAL  
NUMBER  
SOLUTIONS

# WORK ASSIGN

1.1-7 Given the end points of a diameter, find the standard form of the equation of the circle.

Endpoints of a diameter :  $(-3, -2)$ ,  $(3, 2)$



Notice the midpoint of the diameter is the center of the circle.

(1) Use the distance formula to find the diameter then divide it by 2 to find the radius.

$$D = \sqrt{(-3-3)^2 + (-2-2)^2}$$

$$= \sqrt{(-6)^2 + (-4)^2}$$

$$= \sqrt{36 + 16}$$

$$= \sqrt{52} = \sqrt{2 \cdot 2 \cdot 13} = 2\sqrt{13}$$

$$R = \frac{1}{2}D = \frac{1}{2} \cdot (2\sqrt{13}) = \boxed{\sqrt{13}}$$

(2) Use the midpoint formula to find the center

$$\text{midpoint} = \left( \frac{-3+3}{2}, \frac{-2+2}{2} \right)$$

$$\text{center} = (0, 0)$$

(3) put the information together to write the standard form of the circle.

$$(x-0)^2 + (y-0)^2 = (\sqrt{13})^2$$

$$\Rightarrow \boxed{x^2 + y^2 = 13}$$