Trig 4.2

x^2 $x =$
$x =$

*Algebra 2 Ch. 6
Also Alg.1

Solve quadratic equations (factor, CTS, QF)*
Use the discriminant to describe roots

completing the square — all

quadratic formula — all

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

* discriminant — not always
(nature of the roots)

b^2-4ac

conjugates

$a+3i$ $a-3i$

Quadratic formula song

$(x+3)^2$

Algebra tiles

$x^2 + 6x + 9$

$x^2 + 10x + ?$

Complete the square (what is missing?)

$x^2 + 8x + 9$

$x^2 - 6x + 5$

Solve each equation by completing the square.

5. $x^2 + 8x - 20 = 0$

$+20 \quad +20$

$x^2+8x+16 = 20+16$

$\sqrt{(x+4)^2} = \sqrt{36}$

$x+4 = \pm 6$

$-4 \quad -4$

$x = -4 \pm 6$

$x = -4+6 = 2$

$x = -4-6 = -10$

$(\ )^2 = 36$

$x = 3 \pm \sqrt{2}$

Build a perfect square...

are!

2 Solve $3n^2 + 7n + 7 = 0$ by completing the square.

$\frac{3}{3}n^2 + \frac{7}{3}n + \frac{7}{3} = \frac{0}{3}$

$n^2 + \frac{7}{3}n + \frac{49}{36} = -\frac{7}{3}\cdot\frac{12}{12} + \frac{49}{36}$

$\frac{7}{3}\cdot\frac{1}{2}$ $\left(n + \frac{7}{6}\right)^2 = \frac{-84 + 49}{36}$

$\frac{7}{6}\cdot\frac{7}{6}$ $\sqrt{\left(n + \frac{7}{6}\right)} = \sqrt{\frac{-35}{36}}$

$n + \frac{7}{6} = \pm\frac{i\sqrt{35}}{6}$

$n = -\frac{7}{6} \pm \frac{i\sqrt{35}}{6}$

$n = \frac{11}{6}$

How do you choose a method to solve???

Options:

1 Solve $x^2 - 6x - 16 = 0$.

-16

$-8 \quad 2$

-2

$x-8 \quad x+2$

$x=8 \quad x=-2$

QF song!

Quadratic Formula

The roots of a quadratic equation of the form $ax^2 + bx + c = 0$ with $a \neq 0$ are given by the following formula.

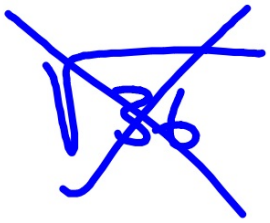
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Solve each equation.

28. $3s^2 - 5s + 9 = 0$ **29.** $x^2 - 3x - 28 = 0$ **30.** $4w^2 + 19w - 5 = 0$

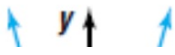
Choice of method

discriminant $= b^2 - 4ac$



$d = 36$

Where have you seen b^2-4ac before?

Discriminant	Nature of Roots/Zeros	Graph
		

"nature of the roots" is not the same question as "solve"

$a=1\ b=-4\ c=15$ 44 $4\wedge 11$

4 Find the discriminant of $x^2 - 4x + 15 = 0$ and describe the nature of the roots of the equation. Then solve the equation by using the Quadratic Formula.

$d = b^2 - 4ac$

$= -4 \cdot -4 - 4 \cdot 1 \cdot 15$

$= 16 - 60$

a) $= -44$ b) 2 complex c) $2 \pm \sqrt{11}\,i$

$$X = \frac{-b \pm \sqrt{-44}}{2a}$$

$$= \frac{4 \pm 2\sqrt{11}\,i}{2}$$

Find the discriminant of each equation and describe the nature of the roots of the equation. Then solve the equation by using the Quadratic Formula.

7. $m^2 + 12m + 36 = 0$

8. $t^2 - 6t + 13 = 0$

Find the discriminant of each equation and describe the nature of the roots of the equation. Then solve the equation by using the Quadratic Formula.

20. $6m^2 + 7m - 3 = 0$

21. $s^2 - 5s + 9 = 0$

22. $36d^2 - 84d + 49 = 0$

23. $4x^2 - 2x + 9 = 0$

+ 2 real
(PS) rational

− 2 complex

0 1 real D.R.

13-37$_0$