The General Quadratic Formula

May 6/2010

Try solving these:

$$1 x^2 - 4x - 5 = 0$$

$$(x-5)(x+1)=0$$

$$(x-5)(x+1)=0$$

$$[x=5] \text{ or } [x=-1]$$

2.
$$x^2 - 4x - 7 = 0$$

S:-7 P:-7 I: no integers

Apr 22-8:57 PM

The Quadratic Formula

If $ax^2 + bx + c = 0$, and $a \neq 0$ (note: must be in standard form)

then

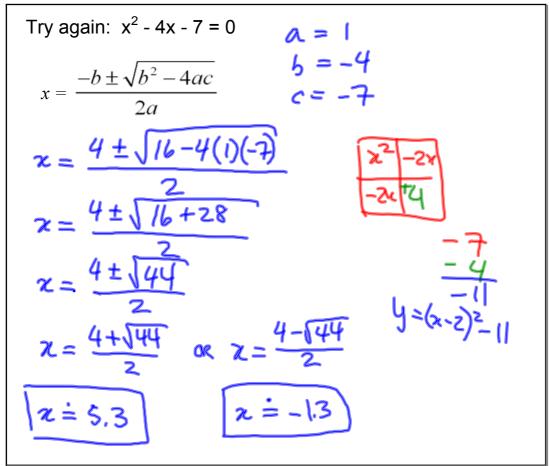
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

See p. 397 for derivation

The $'\pm'$ symbol means there are two solutions.

$$\chi = \frac{-b + \sqrt{b^2 - 4ac}}{2a} \qquad \chi = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

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



Apr 22-9:21 PM

The quadratic formula can be used to solve any quadratic equation that has a solution. Thus we could also use it on our first example, but it will be much slower!

X 4x-5=20

A perfect square under the root tells us that regular factoring would have worked

Try:
$$x^2 - 4x + 5 = 0$$

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

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(5)}}{2(1)}$$
A negative sign under the root cannot be evaluated, so there are no solutions to this equation.

$$4 \pm \sqrt{16 - 20}$$

$$\frac{4 \pm \sqrt{16 - 20}}{2}$$

$$\frac{4 \pm \sqrt{16 - 20}}{2}$$

$$\frac{1}{2}$$

Apr 22-9:26 PM

$$-5x^{2} + 15x = 11 \qquad x = 1.28 \text{ or } x = 1.72$$

$$-1/-1/$$

$$-5x^{2} + 15x - 1/ = 0 \qquad 6 = 15$$

$$2 = -1/5 \pm \sqrt{15^{2} - 4(-5)(+1)}$$

$$= -1/5 \pm \sqrt{225 - 220}$$

$$= -1/5 \pm \sqrt{5}$$

$$= -1/5 \pm \sqrt{5}$$

$$-1/0$$

$$2 = -1/5 + \sqrt{5}$$

$$3 = -1/5 + \sqrt{5}$$

$$2 = -1/5 + \sqrt{5}$$

$$3 = -1/5 + \sqrt{5}$$

Apr 22-9:27 PM

Assigned Work:

p. 403 # 4, 6, 11

Nov 14 - 11:15 PM