**10.6: Solve Quadratic Equations Using the Quadratic Formula**

**Goals:** \*Solve a quadratic equation using the quadratic formula

SO FAR YOU CAN SOLVE QUADRATIC EQUATIONS BY:

**1. Factoring ☺**

**2. Graphing ☹**

**3. Square Roots ☺**

\*\*Remember that in order to solve, you are really being asked to find *x* when… *y* = 0

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

**Solve using the quadratic formula:**

**Ex:** 3*x*² + 5*x* – 8 = 0 **Ex:** 2*x*² + 7*x* = 9

$x=\frac{-5\pm \sqrt{25-4\left(3\right)\left(-8\right)}}{2\left(3\right)}$ *x* = 1 and –4.5

$x=\frac{-5\pm \sqrt{25+96}}{6}$

$x=\frac{-5\pm 11}{6}$

$x=-1 , \frac{8}{3}$

**Ex:** *x*² – 8*x* = –16  **Ex:** 2*x*² – 7 = *x*

*x* = 4 *x* = 2.14 and –1.64

**Ex:** 3*x*² – 1 – *x* **Ex:** 3*n*² – 5*n* = –1 **Ex:** 4*z*² = 7*z* + 2

*x* = 0.77 and –0.43 *n* = 0.23 and 1.43 *z* = 2 and *z* = − ¼

**Ex:** For the period 1971-2001 the number *y*, of films produced in the world can be modeled by the function

*y* = 10*x*² – 94*x* + 3900, where *x* is the number of years since 1971. In what year were 4200 films produced?

*x* = 11.91 and *x* = –2.52 so 11.91 must be the answer, which means 11.91 years since 1971, which would be 1982 (pretty close to 83)

**Ex:** For the period 1990-2003, the number of book titles published by a small publishing company can be modeled by *y* = 0.5*x*² + 4*x* + 19, where *x* is the number of years since 1990. In what year were 80 books published?

*x* is about 8, which would be 1997, close to 1998