Bellwork: Solve the quadratic equation below

$2x^2+6x = 56$

$-56 \quad -56$

$x = \dfrac{-6 \pm \sqrt{(6)^2-4(2)(-56)}}{2(2)}$

$x = \dfrac{-6 \pm \sqrt{484}}{4}$

$x = \dfrac{-6 \pm 22}{4}$

$x = 4, -7$

$2x^2+6x-56=0$ (a, b, c)

$2(x^2+3x-28)=0$

$2(x+7)(x-4)=0$

$x=-7,4$

$x+7=0$

$-7 \quad -7$

-28: $7 \cdot -4$, $1 \cdot 3$

$\dfrac{(-6+22)}{4}$

$\dfrac{16}{4}=4$

$\dfrac{(-6-22)}{4}$

$\dfrac{-28}{4}=-7$

14) $8x^2 = -4x+10$

$+4x \quad +4x \quad -10$

$8x^2+4x-10=0$

$2(4x^2+2x-5)=0$ (a, b, c)

$x = \dfrac{-2 \pm \sqrt{(2)^2-4(4)(-5)}}{2(4)} = \dfrac{-2 \pm \sqrt{84}}{8}$

$84 = 4 \cdot 21$, $21 = 3 \cdot 7$, 22

$x = \dfrac{-2 \pm 2\sqrt{21}}{8} = \boxed{\dfrac{-1 \pm \sqrt{21}}{4}}$

19) $4m^2-8+5m = -6+5m^2+5m$

$-4m^2 \quad +8 \quad -5m \quad +8 \quad -4m^2 \quad -5m$

$0 = m^2+2$

$-2 \quad -2$

$a=1 \quad b=0 \quad c=2$

$\sqrt{m^2} = \pm\sqrt{-2}$

$m = \pm\sqrt{-2}$

$m = \pm i\sqrt{2}$

$m = \dfrac{-0 \pm \sqrt{0^2-4(1)(2)}}{2(1)} = \dfrac{\pm\sqrt{-8}}{2}$

$8 = 4 \cdot 2$, 22

$m = \dfrac{\pm 2i\sqrt{2}}{2}$

$m = \pm i\sqrt{2}$

Solving quadratics review solutions

1) $n^2 + 4n + 3 = 0$

$\{-1, -3\}$

2) $x^2 - 12x + 35 = 0$

$\{7, 5\}$

3) $r^2 - r = 0$

$\{1, 0\}$

4) $a^2 - 2a - 48 = 0$

$\{-6, 8\}$

5) $v^2 = 20 - v$

$\{-5, 4\}$

6) $6x^2 - 18x = 60$

$\{5, -2\}$

7) $-16 - 13m = -m^2 - 7m$

$\{8, -2\}$

8) $16x^2 + 392 = 168x$

$\left\{\frac{7}{2}, 7\right\}$

9) $32b^2 + 56 = 8 + 88b$

$\left\{\frac{3}{4}, 2\right\}$

10) $2b^2 - 9b - 39 = -4$

$\left\{-\frac{5}{2}, 7\right\}$

11) $a^2 - a - 12 = 0$

$\{4, -3\}$

12) $x^2 + 3x + 2 = 0$

$\{-1, -2\}$

13) $x^2 + 2x - 24 = 0$

$\{4, -6\}$

14) $8x^2 = -4x + 10$

$\left\{\frac{-1 + \sqrt{21}}{4}, \frac{-1 - \sqrt{21}}{4}\right\}$

15) $10v^2 - 2v = -9$

$\left\{\frac{1 + i\sqrt{89}}{10}, \frac{1 - i\sqrt{89}}{10}\right\}$

16) $6n^2 = 2 + 10n$

$\left\{\frac{5 + \sqrt{37}}{6}, \frac{5 - \sqrt{37}}{6}\right\}$

17) $x^2 - 3 = -10x$

$\{-5 + 2\sqrt{7}, -5 - 2\sqrt{7}\}$

18) $12m^2 - 18 = 7m + 9m^2$

$\left\{\frac{7 + \sqrt{265}}{6}, \frac{7 - \sqrt{265}}{6}\right\}$

19) $4m^2 - 8 + 5m = -6 + 5m^2 + 5m$

$\{-i\sqrt{2}, i\sqrt{2}\}$

20) $-20 = -a^2$

$\{2\sqrt{5}, -2\sqrt{5}\}$

Today's Objective:

Learn about perfect square trinomials

Perfect Square Trinomial is a trinomial created by squaring a binomial. They will always follow the pattern below:

$$(a+b)^2=a^2+2ab+b^2$$

ex: $(x+3)^2=x^2+6x+9$

Expand the binomial $(a+b)^2=a^2+2ab+b^2$

$(2x-6)^2$ (a = 2x, b = -6)

$(2x)^2+2(2x)(-6)+(-6)^2$

$4x^2-24x+36$

$(x+4)^2=(x)^2+2(x)(4)+4^2$

$x^2+8x+16$

$(x+6)^2 = x^2+12x+36$

$(x-6) = x^2-12x+36$

Condense the perfect square trinomials

$(a+b)^2=a^2+2ab+b^2$ $\sqrt{a^2}=a$ $\sqrt{b^2}=b$

a^2 $2ab$ b^2

$9x^2-12x+4$

$(3x-2)^2$

$25+10x+x^2$

$(5+x)^2$

x^2+4x+4

$(x+2)^2$

If first term is x^2 (no coefficient), b can also be found by taking half of the middle term.

$x^2+10x+25$

$(x+5)^2$

$\frac{10}{2}$

x^2+4x+4

$(x+2)^2$

$\frac{4}{2}$

Find the value that completes the square, then rewrite as a perfect square.

$x^2-16x+\underline{64}$

$(x-8)^2$

$x^2+14x+\underline{49}$

$(x+7)^2$

18) $x^2 - 19x + \frac{361}{4}$

$\left(x - \frac{19}{2}\right)^2$