20.) $0 = 18x^2 + 51x + 8$

$0 = (6x+1)(3x+8)$

$\begin{array}{cc} 6 & 3 \\ 1 & 8 \end{array}$

$48 \quad 3$

$x = -\frac{1}{6}$

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

18.) $5(2x-3)^2 + 4 = -56$

$$\sqrt{(2x-3)^2} = \sqrt{-12}$$

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

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

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

6.) $y = -2x^2 + 16x - 29$

$y = (-2x^2 + 16x + \_\_\_)\_\_\_ - 29$

$y = -2(x^2 - 8x + \underline{16})\underline{+32} - 29$

$y = -2(x-4)^2 + 3$

5.) $g(x) = (-4x^2 + 20x + \_\_\_) \_\_\_ - 1$

$g(x) = -4\left(x^2 - 5x + \frac{25}{4}\right) \underline{25} - 1$

$g(x) = -4\left(x - \frac{5}{2}\right)^2 + 24$

$\left(\frac{5}{2}\right)^2$

1.7: Completing the Square (Day 2)

1) Solve the equation by completing the square.

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

$(x^2 + 4x + \underline{4}) \underline{-4} - 10 = 0$

$(x+2)^2 - 14 = 0$

$\sqrt{(x+2)^2} = \sqrt{14}$

$x + 2 = \pm\sqrt{14}$

$x = -2 \pm \sqrt{14}$

1) placeholders

2) CTS: $(b/2)^2$

3) Factor the trinomial/combine like terms

4) Solve by square root method

2) Solve the equation by completing the square.

$x^2 - 18x + 86 = 0$

$(x^2 - 18x + \underline{81}) \underline{-81} + 86 = 0$

$(x-9)^2 + 5 = 0$

$x = 9 \pm i\sqrt{5}$

3) Solve the equation by completing the square.

$$\frac{4x^2}{4} - \frac{40x}{4} - \frac{12}{4} = \frac{0}{4}$$

$$x^2 - 10x - 3 = 0$$

$$(x^2 - 10x + 25) - 25 - 3 = 0$$

$$\sqrt{(x-5)^2} = \sqrt{28}$$

$$x - 5 = \pm 2\sqrt{7}$$

$$x = 5 \pm 2\sqrt{7}$$

$$(4x^2 - 40x + \_\_) \_\_ - 12$$

$$4(x^2 - 10x + 25) - 100 - 12 =$$

$$4(x-5)^2 - 112 = 0$$

$$\sqrt{(x-5)^2} = \sqrt{28}$$

$$x = 5 \pm 2\sqrt{7}$$

4) Solve.

$x^2 + 9x + 20 = 0$

$(x+5)(x+4)=0$

$x = -5, -4$

$\left(x^2 + 9x + \frac{81}{4}\right) \frac{-81}{4} + 20 = 0$

$\left(x + \frac{9}{2}\right)^2 - \frac{1}{4} = 0$

$\sqrt{\left(x + \frac{9}{2}\right)^2} = \sqrt{\frac{1}{4}}$

$x + \frac{9}{2} = \pm \frac{1}{2}$

$x = \frac{-9}{2} \pm \frac{1}{2}$

$\frac{-9+1}{2}$ $\frac{-9-1}{2}$

5) Solve the equation by completing the square.

$3x^2 + 7x + 17 = 6x + 10$

$a \neq 1$

factor out "a"

$3x^2 + x + 7 = 0$

$(3x^2 + x + \_\_\_)\_\_\_ + 7 = 0$

$3\left(x^2 + \frac{1}{3}x + \frac{1}{36}\right) \frac{-1}{12} + 7 = 0$

$3\left(x + \frac{1}{6}\right)^2 + \frac{83}{12} = 0$

$\frac{-83}{12} \div 3$

$\sqrt{\left(x + \frac{1}{6}\right)^2} = \sqrt{-\frac{83}{36}}$

$x + \frac{1}{6} = \pm \frac{i\sqrt{83}}{6}$

$x = \frac{-1}{6} \pm \frac{\sqrt{83}}{6} i$

$$6 \cdot \frac{2}{3}(x-4) - \frac{6 \cdot 1}{2}(x-6) = 6 \cdot 4(x+1)$$

$$4(x-4) - 3(x-6) = 24(x+1)$$

$$\frac{1}{3} + \frac{1}{2}$$

$$\frac{2}{6} + \frac{3}{6}$$