

Algebra

$$1) 2x + 22 = x + 1$$

$$x = -22 + 1 = -21$$

$$\boxed{x = -21}$$

$$2) x^2 - 8x - 33 = 0$$

$$x^2 + 3x - 11x - 33 = 0$$

$$x(x + 3) - 11(x + 3) = 0$$

$$(x + 3)(x - 11) = 0$$

$$\boxed{x = -3}$$

$$\boxed{x = 11}$$

$$3) \frac{(5m-3)}{4} + \frac{(3m-2)}{5} = \frac{(m+6)}{7}$$

$$\frac{25m-15}{20} + \frac{12m-8}{20} = \frac{m+6}{7}$$

$$\frac{25m+12m-15-8}{20} = \frac{m+6}{7}$$

$$\frac{37m-23}{20} = \frac{m+6}{7}$$

$$259m - 161 = 20m + 120$$

$$239m = 281$$

$$m = \frac{281}{239}$$

$$4) \quad x + y = 82 \quad xy = 1456$$

$$\boxed{y = 82 - x}$$

$$xy = 1456$$

$$x(82 - x) = 1456$$

$$82x - x^2 = 1456$$

$$x^2 - 82x + 1456 = 0$$

$$ax^2 + bx + c = 0$$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{82 \pm \sqrt{(-82)^2 - 4(1456)}}{2}$$

$$= \frac{82 \pm \sqrt{6724 - 5824}}{2} = \frac{82 \pm \sqrt{900}}{2}$$

$$= \frac{82 \pm 30}{2} = 56, 26$$

$$\boxed{x = 56} \text{ or } \boxed{x = 26}$$

$$5) \frac{(y^2 - 4)}{3} = 20$$

$$y^2 - 4 = 60$$

$$y^2 = 64$$

$$y = -8, 8$$

$$6) \quad 2x + y = 8$$

$$4x + 2y = 16$$

$$3y = 4 + 4x$$

$$4x - 3y = -4$$

$$4x + 2y = 16$$

$$\begin{array}{r} 4x - 3y = -4 \\ (-) \quad (+) \quad (+) \end{array}$$

$$5y = 20$$

$$\boxed{y = 4}$$

$$2x + y = 8$$

$$2x + 4 = 8$$

$$2x = 8 - 4 = 4$$

$$x = \frac{4}{2} = 2$$

$$x = 2$$

$$y = 4$$

Formula to Remember

$$ax^2 + bx + c = 0$$

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