

## F Michaelmas Equations Consolidation

1. Solve:

(a)  $4x - 2 = 3x + 8.$

$$x = 10$$

(b)  $3 - 5x = 2x - 1.$

$$x = \frac{4}{7}$$

(c)  $2x - 7 = 5x - 7.$

$$x = 0$$

2. Solve:

(a)  $2(x + 3) + 4(2x + 1) = 1.$

$$x = -\frac{9}{10}$$

(b)  $3(2x - 1) - 2(x + 4) = 2x - 7.$

$$x = 2$$

(c)  $2x - 3(8 - x) = 7(2 - 5x).$

$$x = \frac{19}{20}$$

(d)  $2 - (2x - 19) = 2(7 - 8x).$

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

(e)  $(x - 3)(x - 7) = (x + 1)(x - 2).$

$$x = \frac{23}{9}$$

(f)  $(2x + 1)(5 - x) = 6 - (3 - x)(7 - 2x).$

$$x = 5$$

3. In the equation  $x - a = b$  the solution is  $x = b + a$ . Therefore in the following equations attempt to solve them by isolating the  $x$ .

(a)  $ax - b = c.$

$$x = \frac{b+c}{a}$$

(b)  $ax + b = b.$

$$x = 0$$

(c)  $\frac{x}{a} + b = c.$

$$x = a(c - b)$$

(d)  $a = \frac{b}{x}.$

$$x = \frac{b}{a}$$

(e)  $\frac{ax}{b+c} = a.$

$$x = b + c$$

(f)  $ax + d = 3x - 2.$

$$x = \frac{2+d}{3-a}$$

(g)  $\frac{ax}{bx+c} = d.$

$$x = \frac{cd}{a-bd}$$

(h)  $\frac{x-e}{x+ax-f} = d.$

$$x = \frac{e-df}{1-d-ad}$$

(i)  $(ax + 2)(x - 3) = a(x - 3)(x - k).$

$$x = \frac{3ak+d}{2+ak}$$

4. Solve:

(a)  $\frac{x}{3} + 7 = \frac{2x}{4}.$

$$x = 42$$

(b)  $\frac{2x+1}{4} + \frac{3x-1}{5} = 1.$

$$x = \frac{19}{22}$$

(c)  $\frac{3x-2}{2} - \frac{2-x}{5} = \frac{x+1}{10}.$

$$x = \frac{15}{16}$$

(d)  $\frac{2(x+1)}{3} - 2 = \frac{4x-1}{7} + \frac{2}{3}.$

$$x = \frac{39}{2}$$

(e)  $\frac{2x+5}{x} = 3\frac{2}{3}.$

$$x = 3$$

5. Solve the following simultaneous equations:

(a)  $x + y = 5$   
 $x - y = 1$

$$(x, y) = (3, 2)$$

$$(b) \begin{cases} 2x + y = 7 \\ x - y = 5 \end{cases} \quad \boxed{(x, y) = (4, -1)}$$

$$(c) \begin{cases} 2x + y = 5 \\ 4x + 3y = 14 \end{cases} \quad \boxed{(x, y) = \left(\frac{1}{2}, 4\right)}$$

$$(d) \begin{cases} x + 2y = 6 \\ 3x - 2y = 0 \end{cases} \quad \boxed{(x, y) = \left(\frac{3}{2}, \frac{9}{4}\right)}$$

$$(e) \begin{cases} 2x + 3y = 42 \\ 3x - 4y = -5 \end{cases} \quad \boxed{(x, y) = (9, 8)}$$

6. A couple of slightly more challenging questions to get you thinking...

$$(a) \frac{2x + \frac{2x-1}{3}}{3} + 2x - 3 = 1. \quad \boxed{x = \frac{37}{26}}$$

$$(b) \begin{cases} \frac{x+2y}{5} + \frac{5x-2y}{2} = \frac{3}{2} \\ 2x - y = 0 \end{cases} \quad \boxed{(x, y) = (1, 2)}$$