

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

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

$$(b) \begin{cases} 2x + y = 7 \\ x - y = 5 \end{cases}$$

$$(x, y) = (4, -1)$$

$$(c) \begin{cases} 2x + y = 5 \\ 4x + 3y = 14 \end{cases}$$

$$(x, y) = \left(\frac{1}{2}, 4\right)$$

$$(d) \begin{cases} x + 2y = 6 \\ 3x - 2y = 0 \end{cases}$$

$$(x, y) = \left(\frac{3}{2}, \frac{9}{4}\right)$$

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

$$(x, y) = (9, 8)$$

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

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

$$x = \frac{37}{26}$$

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

$$(x, y) = (1, 2)$$