Further Factorising 1

1. The equation of a line is given as

$$3y + 4x - 2 = 0.$$

What is the gradient of the line?

2. A rectangle has area A, length y and width $x - 2$. Write an expression for the length of the rectangle, y, in terms of A and x

3. Make x the subject of:

$$ax - y = z + bx$$

4. Make b the subject of:

$$5(b - p) = 2(b + 3)$$

5. John says the first step to rearranging $\frac{x-a}{f} = 3g$ is to add a to $3g$. Is he right? Explain your answer.

6. Make a the subject of

$$5(a - t) = 3(a + x)$$

7. Make x the subject of

$$ay + x = 4x + xb$$

8. Make x the subject of

$$2\pi\sqrt{x + t} = 4$$

Further Factorising 1

Solutions on the next slide….

Further Factorising 1 Solutions

1. The equation of a line is given as

$$3y + 4x - 2 = 0.$$

What is the gradient of the line?

$$3y = -4x + 2$$
$$y = -\frac{4}{3}x + \frac{2}{3}$$
gradient = $-\frac{4}{3}$

2. A rectangle has area A, length y and width $x - 2$. Write an expression for the length of the rectangle, y, in terms of A and x

$$A = y(x - 2)$$
$$y = \frac{A}{x - 2}$$

3. Make x the subject of:

$$ax - y = z + bx$$

$$ax - bx = z + y$$
$$x(a - b) = z + y$$
$$x = \frac{z + y}{a - b}$$

4. Make b the subject of:

$$5(b - p) = 2(bx + 3)$$

$$5b - 5p = 2bx + 6$$
$$5b - 2bx = 6 + 5p$$
$$b(5 - 2x) = 6 + 5p$$
$$b = \frac{6 + 5p}{5 - 2x}$$

Unsure about any of these? Search Rearranging and Factorising Next try Skills check 2….

Further Factorising 1 Solutions

5. John says the first step to rearranging $\frac{x-a}{f} = 3g$ is to add a to $3g$. Is he right? Explain your answer.

→ No, the first step is to multiply by f

6. Make a the subject of

$$5(a - t) = 3(a + x)$$

→

$$5a - 5t = 3a + 3x$$
$$5a - 3a = 3x + 5t$$
$$2a = 3x + 5t$$
$$a = \frac{3x + 5t}{2}$$

7. Make x the subject of

$$ay + x = 4x + xb$$

→

$$ay = 3x + xb$$
$$x(3 + b) = ay$$
$$x = \frac{ay}{3 + b}$$

8. Make x the subject of

$$2\pi\sqrt{x + t} = 4$$

→

$$\sqrt{x + t} = \frac{4}{2\pi}$$
$$\sqrt{x + t} = \frac{2}{\pi}$$
$$x + t = \frac{4}{\pi^2} \qquad x = \frac{4}{\pi^2} - t$$

Unsure about any of these? Search Rearranging and Factorising Next try Skills check 2….

Further Factorising 2

1. Make y the subject of

$$xy + 6 = 7 - ky$$

2. Find an expression for the area of a rectangle with length, $(y - x)$ and width, $(x - 2)$

3. Rewrite your expression in Q2 to have y expressed in terms of A and x

4. Make y the subject of $\frac{4}{y} + 1 = 2x$

5. Displacement can be expressed as

$$s = ut + \frac{1}{2}at^2$$

Express a in terms of s, u and t

6. Make y the subject of $\sqrt{by^2 - x} = D$

7. The area of a trapezium has formula

$$A = \frac{1}{2}\left(\frac{a+b}{h}\right)$$

Express h in terms of A, a and b

8. Make t the subject $b(t + a) = x(t + b)$

Further Factorising 2

Solutions on the next slide….

Further Factorising 2 Solutions

1. Make y the subject of

$$xy + 6 = 7 - ky$$

$$xy + ky = 1$$
$$y(x + k) = 1$$
$$y = \frac{1}{x + k}$$

2. Find an expression for the area of a rectangle with length, $(y - x)$ and width, $(x - 2)$

Area = $(y - x)(x - 2)$
$$A = xy - x^2 - 2y + 2x$$

3. Rewrite your expression in Q2 to have y expressed in terms of A and x

$$A = xy - x^2 - 2y + 2x$$
$$2y - xy = 2x - x^2 - A$$
$$y(2 - x) = 2x - x^2 - A$$
$$y = \frac{2x - x^2 - A}{2 - x}$$

4. Make y the subject of $\frac{4}{y} + 1 = 2x$

$$\frac{4}{y} = 2x - 1$$
$$y(2x - 1) = 4$$
$$y = \frac{4}{2x - 1}$$

Further Factorising 2 Solutions

5. Displacement can be expressed as

$$s = ut + \frac{1}{2}at^2$$

Express a in terms of s, u and t

$$\frac{1}{2}at^2 = s - ut$$
$$at^2 = 2s - 2ut$$
$$a = \frac{2s - 2ut}{t^2}$$

Solution

6. Make y the subject of $\sqrt{by^2 - x} = D$

$$by^2 - x = D^2$$
$$by^2 = D^2 + x$$
$$y^2 = \frac{(D^2 + x)}{b}$$
$$y = \pm\sqrt{\frac{D^2 + x}{b}}$$

7. The area of a trapezium has formula

$$A = \frac{1}{2}\left(\frac{a+b}{h}\right)$$

Express h in terms of A, a and b

$$2hA = a + b$$
$$h = \frac{a + b}{2A}$$

8. Make t the subject $b(t + a) = x(t + b)$

$$bt + ba = xt + xb$$
$$bt - xt = xb - ba$$
$$t(b - x) = xb - ba$$
$$t = \frac{xb - ba}{b - x}$$