Q1-2

1

Get gh on its own (by multiplying both sides by 10)

$$10t = gh$$

[1]

Get h on its own (by dividing both sides by g)

$$\frac{10t}{g} = h$$

$\boldsymbol{h = \frac{10t}{g}}$ [1]

2

Get $3t$ on its own (by subtracting 11 from both sides)

$$w - 11 = 3t$$

[1]

Get t on its own (by dividing both sides by 3)

$$\frac{w - 11}{3} = t$$

$\boldsymbol{t = \frac{w - 11}{3}}$ [1]

Q3

3

Get $\frac{t}{3}$ on its own (by adding $2a$ to both sides)

$$y + 2a = \frac{t}{3}$$

[1]

Get t on its own (by multiplying both sides by 3)

$$3(y + 2a) = t$$

$\boldsymbol{t = 3(y + 2a)}$ [1]

$t = 3y + 6a$ is also accepted

Q4

Get $5(F-32)$ on its own (by multiplying both sides by 9)

$$9C = 5(F-32)$$

[1]

Method 1
Get $F-32$ on its own (by dividing both sides by 5)

$$\frac{9C}{5} = F-32$$

[1]

Get F on its own (by adding 32 to both sides)

$$\frac{9C}{5} + 32 = F$$

$$\boldsymbol{F = \frac{9C}{5} + 32}$$ [1]

Method 2
Expand the brackets

$$9C = 5F - 160$$

Get $5F$ on its own (by adding 160 to both sides)

$$9C + 160 = 5F$$

[1]

Method 2
Expand the brackets

$$9C = 5F - 160$$

Get $5F$ on its own (by adding 160 to both sides)

$$9C + 160 = 5F$$

[1]

Get F on its own (by dividing both sides by 5)

$$\frac{9C+160}{5} = F$$

$$\boldsymbol{F = \frac{9C+160}{5}}$$ [1]

either answers from Method 1 or Method 2 are accepted

Q5

5

Isolate the term involving t first, the at term by adding d to both sides.

$$p + d = at$$

[1]

Isolate t by dividing both sides by a.

$$\frac{p+d}{a} = t$$

$$\boldsymbol{\therefore t = \frac{p+d}{a}}$$ [1]

Equivalent expressions allowed such as $t = \frac{p}{a} + \frac{d}{a}$.

Q6-7

6

Isolate the term involving a first, the $2ac$ term by subtracting g from both sides.

$$d - g = 2ac$$

[1]

Isolate a by dividing both sides by $2c$.

$$\frac{d-g}{2c} = a$$

$$\therefore a = \frac{d-g}{2c}$$ [1]

Equivalent expressions allowed such as $a = \frac{d}{2c} - \frac{g}{2c}$.

7

Isolate the term involving a first, the ac term by adding bd to both sides.

$$M + bd = ac$$

[1]

Isolate a by dividing both sides by c.

$$\frac{M+bd}{c} = a$$

$$\therefore a = \frac{M+bd}{c}$$ [1]

Equivalent expressions allowed such as $a = \frac{M}{c} + \frac{bd}{c}$.

Q8-9

8

Isolate the term involving e first, the $3e$ term by subtracting f from both sides.

$$h - f = 3e$$

[1]

Isolate e by dividing both sides by 3.

$$\frac{h-f}{3} = e$$

$$\therefore e = \frac{h-f}{3}$$ [1]

Equivalent expressions allowed such as $e = \frac{1}{3}(h-f)$.

9

Isolate the term involving t first, the t^3 term by adding $8v$ to both sides.

$$c + 8v = t^3$$

[1]

Isolate t by taking the cube root of both sides.

$$\sqrt[3]{c+8v} = t$$

$$\therefore t = \sqrt[3]{c+8v}$$ [1]

Equivalent expressions allowed such as $t = (c+8v)^{\frac{1}{3}}$.

Q10-11

Add 2 to both sides of the equation.

$$y + 2 = 3x$$

Divide both sides by 3.

$$\frac{y+2}{3} = x$$

$$x = \frac{y+2}{3}$$ [1]

If you divide the left hand side by 3, then subtract 2 from both sides, you get the incorrect answer of $x = \frac{y}{3} - 2$.

If you subtract 2 from both sides, then divide both sides by 3, you get the incorrect answer of $x = \frac{y-2}{3}$.

If you divide the left hand side by 3, then add 2 to both sides you get the incorrect answer of $x = \frac{y}{3} + 2$.

11

Start by subtracting u from both sides.

$$v - u = at$$

[1]

Divide both sides by a.

$$\frac{v-u}{a} = t$$

$$\therefore t = \frac{v-u}{a}$$ [1]

Q12-13

12

Subtract 7 from both sides.

$$x - 7 = y^2$$

[1]

It may be easier here to swap the left and right sides, although it is not necessary.

$$y^2 = x - 7$$

Take the square root of both sides, remember that a square root can be both positive or negative.

$$y^2 = x - 7$$

$$\sqrt{\quad} \qquad \sqrt{\quad}$$

$$y = \pm\sqrt{x - 7}$$

$$y = \pm\sqrt{x - 7}$$ [1]

± sign not necessary for full marks

13

Isolate the term involving x by adding 3 to both sides of the equation.

$$y + 3 = 7x$$

[1]

Isolate x by dividing boths sides by 7.

$$\frac{y+3}{7} = x$$

$$x = \frac{y+3}{7}$$ [1]