8 Rearrange this equation to make x the subject.

$y = 7x + 2$

$y = 7x + 2$

$-2 \quad -2$

$y - 2 = 7x$

$\div 7 \quad \div 7$

$\frac{y-2}{7} = x$

$x =$ $\frac{y-2}{7}$ [2]

7 Make x the subject of this formula.

$2y = 5x - 7$

$2y = 5x - 7$

$+7 \quad +7$

$2y + 7 = 5x$

$\div 5 \quad \div 5$

$\frac{2y+7}{5} = x$

$x =$ $\frac{2y+7}{5}$ [2]

11 $y = \frac{w^2}{2}$

Rearrange the formula to make w the subject.

$y = \frac{w^2}{2}$

$\times 2 \quad \times 2$

$2y = w^2$

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

$\sqrt{2y} = w$

$w =$ $\sqrt{2y}$ [1]

8 $s = \frac{1}{2}at^2$

(a) Work out the value of s when $a = 0.9$ and $t = 4$.

$s = \frac{1}{2}(0.9) \times 4^2$

$= 7.2$

$s =$ 7.2 [1]

(b) Rearrange the formula to find t in terms of s and a.

$s = \frac{at^2}{2}$

$\times 2 \quad \times 2$

$2s = at^2$

$\div a \quad \div a$

$\frac{2s}{a} = t^2$

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

$\sqrt{\frac{2s}{a}} = t$

$t =$ $\sqrt{\frac{2s}{a}}$ [2]

19 Make y the subject of the formula.

$h^2 = x^2 + 2y^2$

$h^2 = x^2 + 2y^2$

$-x^2 \quad -x^2$

$h^2 - x^2 = 2y^2$

$\div 2 \quad \div 2$

$\frac{h^2 - x^2}{2} = y^2$

$\sqrt{\frac{h^2 - x^2}{2}} = y$

$y =$ $\sqrt{\frac{h^2 - x^2}{2}}$ [3]

10 Rearrange the formula to make x the subject.

$y(x + 4) = 2$

$y(x + 4) = 2$

$xy + 4y = 2$

$-4y \quad -4y$

$xy = 2 - 4y$

$\div y \quad \div y$

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

$x =$ $\frac{2 - 4y}{y}$ [2]

12 Rearrange this formula to make R the subject.

$$P = \frac{2(Q+3R)}{5}$$

$P = \frac{2Q + 6R}{5}$ ×5 ×5

$5P = 2Q + 6R$

−2Q −2Q

$5P - 2Q = 6R$

÷6 ÷6

$\frac{5P - 2Q}{6} = R$

$R =$ $\frac{5P - 2Q}{6}$ [3]

8 $A = 2\pi rh + 3\pi r^2$

Rearrange the formula to write h in terms of π, r and A.

$A = 2\pi rh + 3\pi r^2$

$-3\pi r^2$ $-3\pi r^2$

$A - 3\pi r^2 = 2\pi rh$

$\div 2\pi r$ $\div 2\pi r$

$\frac{A - 3\pi r^2}{2\pi r} = h$

$h =$ $\frac{A - 3\pi r^2}{2\pi r}$ [2]

14 $y = 2w^2 - x$

Rearrange the formula to make w the subject.

$y = 2w^2 - x$

$+x$ $+x$

$y + x = 2w^2$

$\div 2$ $\div 2$

$\frac{y+x}{2} = w^2$

$\sqrt{}$ $\sqrt{}$

$\sqrt{\frac{y+x}{2}} = w$

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

7 $J = h^3 + k^3$

(a) Find the value of J when $h = 3$ and $k = 4$.

$J = 3^3 + 4^3$

$= 91$

$J =$ 91 [2]

(b) Rearrange the formula to write h in terms of J and k.

$J = h^3 + k^3$

$-k^3 \quad -k^3$

$J - k^3 = h^3$

$\sqrt[3]{\quad} \quad \sqrt[3]{\quad}$

$\sqrt[3]{J - k^3} = h$

$h =$ $\sqrt[3]{J - k^3}$ [2]

10 $J = m(k^2 + h^2)$

Rearrange the formula to make h the subject.

$J = mk^2 + mh^2$

$-mk^2 \quad -mk^2$

$J - mk^2 = mh^2$

$\div m \quad \div m$

$\frac{J - mk^2}{m} = h^2$

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

$\sqrt{\frac{J - mk^2}{m}} = h$

$h =$ $\sqrt{\frac{J - mk^2}{m}}$ [3]

11 $P = M(g^2 + h^2)$

(a) Find the value of P when $M = 100$, $g = 3$ and $h = 4.5$.

$P = 100(3^2 + 4.5^2)$

$= 2925$

$P =$ 2925 [2]

(b) Rearrange the formula to write g in terms of P, M and h.

$P = Mg^2 + Mh^2$

$-Mh^2 \quad - Mh^2$

$P - Mh^2 = Mg^2$

$\div M \quad \div M$

$\frac{P - Mh^2}{M} = g^2$

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

$\sqrt{\frac{P - Mh^2}{M}} = g$

$g =$ $\sqrt{\frac{P - Mh^2}{M}}$ [3]

15 $y = \sqrt{u^2 x}$

(a) Find the value of y when $u = 7$ and $x = 25$.

$y = \sqrt{7^2 \times 25}$

$= 35$

$y =$ 35 [2]

(b) Rearrange the formula to write x in terms of u and y.

$y = \sqrt{u^2 x}$

square square

$y^2 = u^2 x$

$\div u^2 \quad \div u^2$

$\frac{y^2}{u^2} = x$

$x =$ $\frac{y^2}{u^2}$ [2]

15 $T = \sqrt{3d - e}$

Rearrange the formula to make d the subject.

$T = \sqrt{3d - e}$

sq. sq.

$T^2 = 3d - e$

$+e$ $+e$

$T^2 + e = 3d$

$\div 3$ $\div 3$

$\frac{T^2 + e}{3} = d$

$d =$ $\frac{T^2 + e}{3}$ [3]

10 Rearrange the formula to write x in terms of a and y.

$y = \sqrt{x^2 + 2a^2}$

$y = \sqrt{x^2 + 2a^2}$

sq. sq.

$y^2 = x^2 + 2a^2$

$-2a^2$ $-2a^2$

$y^2 - 2a^2 = x^2$

$\sqrt{}$ $\sqrt{}$

$\sqrt{y^2 - 2a^2} = x$

$x =$ $\sqrt{y^2 - 2a^2}$ [3]

15 $m = 2p + \sqrt{\frac{x}{y}}$

Make x the subject of this formula.

$m = 2p + \sqrt{\frac{x}{y}}$

$-2p$ $-2p$

$m - 2p = \sqrt{\frac{x}{y}}$

sq. sq.

$(m - 2p)^2 = \frac{x}{y}$

$\times y$ $\times y$

$y(m - 2p)^2 = x$

$x =$ $y(m - 2p)^2$ [3]

15 Rearrange the equation to make x the subject.

$$A + 4y = A(2 - 3x)$$

$A + 4y = 2A - 3Ax$

$+ 3Ax \qquad + 3Ax$

$3Ax + A + 4y = 2A$

$-A \qquad -A$

$3Ax + 4y = A$

$-4y \qquad -4y$

$3Ax = A - 4y$

$\div 3A \qquad \div 3A$

$x = \dfrac{A - 4y}{3A}$

$x =$ $\dfrac{A - 4y}{3A}$ [3]

(b) Rearrange the formula $V = 2x^3 - 3y^3$ to make y the subject.

$V = 2x^3 - 3y^3$

$+ 3y^3 \qquad + 3y^3$

$V + 3y^3 = 2x^3$

$-V \qquad -V$

$3y^3 = 2x^3 - V$

$\div 3 \qquad \div 3$

$y^3 = \dfrac{2x^3 - V}{3}$

$\sqrt[3]{\ } \qquad \sqrt[3]{\ }$

$y = \sqrt[3]{\dfrac{2x^3 - V}{3}}$

$y =$ $\sqrt[3]{\dfrac{2x^3 - V}{3}}$ [3]

14 $A = P(1 + x)^3$

Rearrange the formula to write x in terms of A and P.

$A = P(1 + x)^3$

$\div P \qquad \div P$

$\dfrac{A}{P} = (1 + x)^3$

$\sqrt[3]{\ } \qquad \sqrt[3]{\ }$

$\sqrt[3]{\dfrac{A}{P}} = 1 + x$

$-1 \qquad -1$

$\sqrt[3]{\dfrac{A}{P}} - 1 = x$

$x =$ $\sqrt[3]{\dfrac{A}{P}} - 1$ [3]

11 $y = \frac{2}{x+3}$

Rearrange the formula to make x the subject.

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

$\times (x+3)$ $\times (x+3)$

$y(x+3) = 2$

$xy + 3y = 2$

$-3y$ $-3y$

$xy = 2 - 3y$

$\div y$ $\div y$

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

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

(d) Make x the subject of the formula. $x = \frac{3+x}{y}$

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

$\times y$ $\times y$

$xy = 3 + x$

$-x$ $-x$

$xy - x = 3$

$x(y-1) = 3$

$\div (y-1)$ $\div (y-1)$

$x = \frac{3}{y-1}$

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

14 Make x the subject of $A = \frac{3(x+y)}{x}$.

$$A = \frac{3x + 3y}{x} \quad \times x \quad \times x$$

$$Ax = 3x + 3y \quad -3x \quad -3x$$

$$Ax - 3x = 3y$$

$$x(A-3) = 3y \quad \div(A-3) \quad \div(A-3)$$

$$x = \frac{3y}{A-3}$$

$x =$ $\frac{3y}{A-3}$ [3]

18 Make x the subject of the formula.

$$c = \frac{3x}{2x-5}$$

$$C = \frac{3x}{2x-5} \quad \times(2x-5) \quad \times(2x-5)$$

$$C(2x-5) = 3x$$

$$2Cx - 5C = 3x \quad +5C \quad +5C$$

$$2Cx = 3x + 5C \quad -3x \quad -3x$$

$$2Cx - 3x = 5C$$

$$x(2C-3) = 5C \quad \div(2C-3) \quad \div(2C-3)$$

$$x = \frac{5C}{2C-3}$$

$x =$ $\frac{5C}{2C-3}$ [4]

17 Rearrange the formula to make m the subject.

$$R = \frac{2(m-k)}{m}$$

$$R = \frac{2m - 2k}{m} \quad \times m \quad \times m$$

$$mR = 2m - 2k \quad -2m \quad -2m$$

$$mR - 2m = -2k$$

$$m(R-2) = -2k \quad \div(R-2) \quad \div(R-2)$$

$$m = \frac{-2k}{R-2}$$

$m =$ $\frac{-2k}{R-2}$ [4]

14 Make x the subject of the formula.

$$\frac{p}{x} = \frac{q}{x-2}$$

$p(x-2) = qx$

$px - 2p = qx$

$+2p \quad +2p$

$px = qx + 2p$

$-qx \quad -qx$

$px - qx = 2p$

$x(p-q) = 2p$

$\div(p-q) \quad \div(p-q)$

$x = \frac{2p}{p-q}$

$x =$ ..... $\frac{2p}{p-q}$ ..... [3]

12 Rearrange this formula to make x the subject.

$$y = \frac{a-x}{3x}$$

$y = \frac{a-x}{3x}$

$\times 3x \quad \times 3x$

$3xy = a - x$

$+x \quad +x$

$3xy + x = a$

$x(3y+1) = a$

$\div(3y+1) \quad \div(3y+1)$

$x = \frac{a}{3y+1}$

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

15 Make h the subject of the formula $2mh = g(1-h)$.

$2mh = g - gh$

$+gh \quad +gh$

$2mh + gh = g$

$h(2m+g) = g$

$\div(2m+g) \quad \div(2m+g)$

$h = \frac{g}{2m+g}$

$h =$ ..... $\frac{g}{2m+g}$ ..... [4]

(e) Make x the subject of the formula.

$$y = \frac{5(p-2x)}{x}$$

$$y = \frac{5p - 10x}{x} \quad \times x$$

$$xy = 5p - 10x \quad +10x \quad +10x$$

$$xy + 10x = 5p$$

$$x(y+10) = 5p \quad \div(y+10) \quad \div(y+10)$$

$$x = \frac{5p}{y+10}$$

$x =$ $\frac{5p}{y+10}$ [4]

18 Make t the subject of the formula.

$$2 = \frac{m(1-t)}{pt}$$

$$2 = \frac{m - mt}{pt} \quad \times pt \quad \times pt$$

$$2pt = m - mt \quad +mt \quad +mt$$

$$2pt + mt = m$$

$$t(2p+m) = m \quad \div(2p+m) \quad \div(2p+m)$$

$$t = \frac{m}{2p+m}$$

$t =$ $\frac{m}{2p+m}$ [4]

17 $y = \frac{3x-2}{1-x}$

Make x the subject of the formula.

$$y = \frac{3x-2}{1-x}$$

$\times(1-x)$ $\times(1-x)$

$$y(1-x) = 3x-2$$

$$y - xy = 3x - 2$$

$+xy$ $+xy$

$$y + 2 = 3x + xy$$

$+2$ $+2$

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

$\div(3+y)$ $\div(3+y)$

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

$x =$ $\frac{y+2}{3+y}$ [4]

9 Rearrange this equation to make x the subject.

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

$$5ax = b(2x-3)$$

$$5ax = 2bx - 3b$$

$-2bx$ $-2bx$

$$5ax - 2bx = -3b$$

$$x(5a - 2b) = -3b$$

$\div(5a-2b)$ $\div(5a-2b)$

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

$x =$ $\frac{-3b}{5a-2b}$ [3]