Rearranging Formulae

Ex 1 $V = IR$ Make R subject

$$\frac{V}{I} = R \qquad R = \frac{V}{I}$$

Ex 2 $I = \frac{PRT}{100}$ Make T subject

$$100I = PRT$$

$$\frac{100I}{PR} = T \qquad T = \frac{100I}{PR}$$

Ex 3 $P = 2(L+B)$ Make L subject

$$\frac{P}{2} = L + B$$

$$\frac{P}{2} - B = L \qquad L = \frac{P}{2} - B$$

OR

$$P = 2(L+B)$$

$$P = 2L + 2B$$

$$P - 2B = 2L \qquad L = \frac{P-2B}{2}$$

$$\frac{P-2B}{2} = L$$

Ex 4 $V = \frac{1}{3}\pi r^2 h$ Make r subject

$$3V = \pi r^2 h$$

$$\frac{3V}{\pi h} = r^2 \qquad r = \sqrt{\frac{3V}{\pi h}}$$

$$\sqrt{\frac{3V}{\pi h}} = r$$

Ex5 $\quad a = 2\sqrt{b^2-2}$ $\quad$ Make b subject

$$\frac{a}{2} = \sqrt{b^2-2}$$

$$\frac{a^2}{4} = b^2-2$$

$$\frac{a^2}{4}+2 = b^2$$

$$\pm\sqrt{\frac{a^2}{4}+2} = b$$

$$b = \pm\sqrt{\frac{a^2}{4}+2}$$

Ex6 $\quad v^2 = u^2 + 2as$ $\quad$ make u subject

$$v^2 - 2as = u^2$$

$$\sqrt{v^2-2as} = u$$

$$u = \sqrt{v^2-2as}$$

Ex7 $\quad T = 2\pi\sqrt{\frac{L}{g}}$ $\quad$ Make L subject

$$\frac{T}{2\pi} = \sqrt{\frac{L}{g}}$$

$$\frac{T^2}{4\pi^2} = \frac{L}{g}$$

$$\frac{gT^2}{4\pi^2} = L$$

$$L = \frac{gT^2}{4\pi^2}$$

Ex 8 $\quad y = \dfrac{5+x}{1-x}$ Make x subject

$$y(1-x) = 5+x$$
$$y - yx = 5+x$$
$$y-5 = x+yx$$
$$y-5 = x(1+y)$$
$$\frac{y-5}{1+y} = x \qquad x = \frac{y-5}{1+y}$$

Exercise

1) $\quad p = \dfrac{q+3}{q-2}$ Make q subject

$$p(q-2) = q+3$$
$$pq - 2p = q+3$$
$$pq - q = 3+2p$$
$$q(p-1) = 3+2p$$
$$q = \frac{3+2p}{p-1}$$

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2) $\quad h = \dfrac{2k+1}{3k-4}$ make k subject

$$h(3k-4) = 2k+1$$

$$3hk - 4h = 2k + 1$$
$$3hk - 2k = 1 + 4h$$
$$k(3h - 2) = 1 + 4h$$
$$k = \frac{1 + 4h}{3h - 2}$$

EXERCISE 5N

HINTS AND TIPS

Remember about inverse operations, and the rule "change sides, change signs".

1. $T = 3k$ — Make k the subject.
2. $X = y - 1$ — Express y in terms of X.
3. $Q = \frac{p}{3}$ — Express p in terms of Q.
4. $A = 4r + 9$ — Make r the subject.
5. $W = 3n - 1$ — Make n the subject.
6. $p = m + t$ — **a** Make m the subject. **b** Make t the subject.
7. $g = \frac{m}{v}$ — Make m the subject.
8. $t = m^2$ — Make m the subject.
9. $C = 2\pi r$ — Make r the subject.
10. $A = bh$ — Make b the subject.
11. $P = 2l + 2w$ — Make l the subject.
12. $m = p^2 + 2$ — Make p the subject.
13. $v = u + at$ — **a** Make a the subject. **b** Make t the subject.
14. $A = \frac{1}{4}\pi d^2$, — Make d the subject.
15. $W = 3n + t$ — **a** Make n the subject. **b** Express t in terms of n and W.
16. $x = 5y - w$ — **a** Make y the subject. **b** Express w in ~~terms of x~~ and y.
17. $k = 2p^2$ — Make p the subject.
18. $v = u^2 - t$ — **a** Make t the subject. **b** Make u the subject.
19. $k = m + n^2$ — **a** Make m the subject. **b** Make n the subject.
20. $T = 5r^2$ — Make r the subject.
21. $K = 5n^2 + w$ — **a** Make w the subject. **b** Make n the subject.

1) $T = 3k$

$\frac{T}{3} = k$

$k = \frac{T}{3}$

2) $x = y - 1$

$x + 1 = y$

$y = x + 1$

3) $Q = \frac{P}{3}$

$3Q = P$

$P = 3Q$

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4) $A = 4r + 9$

$A - 9 = 4r$

$\frac{A-9}{4} = r$

$r = \frac{A-9}{4}$

5) $W = 3n - 1$

$W + 1 = 3n$

$\frac{W+1}{3} = n$

$n = \frac{W+1}{3}$

6) $p = m + t$

$p - t = m$

$m = p - t$

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7) $g = \frac{m}{V}$

$gV = m$

$m = gV$

8) $t = m^2$

$\pm\sqrt{t} = m$

$m = \pm\sqrt{t}$

9) $C = 2\pi r$

$\frac{C}{2\pi} = r$

$r = \frac{C}{2\pi}$

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10) $A = bh$

$\frac{A}{h} = b$

$b = \frac{A}{h}$

11) $P = 2L + 2W$

$P - 2W = 2L$

$\frac{P-2W}{2} = L$

$L = \frac{P-2W}{2}$

12) $m = p^2 + 2$

$m - 2 = p^2$

$\pm\sqrt{m-2} = p$

$p = \pm\sqrt{m-2}$

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13) $V = u + at$

$V - u = at$

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

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

14) $A = \frac{1}{4}\pi d^2$

$4A = \pi d^2$

$\frac{4A}{\pi} = d^2$

$\pm\sqrt{\frac{4A}{\pi}} = d$

$d = \pm\sqrt{\frac{4A}{\pi}}$

15) $W = 3n + t$

$W - t = 3n$

$\frac{W-t}{3} = n$

$n = \frac{W-t}{3}$