Changing the Subject of a Formula

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1)

Change the subject of the formula

$$r = 3p + 2t$$

to p. **2**

$r = 3p + 2t$

$-2t \qquad -2t$

$3p = r - 2t$ ✓

$\div 3 \qquad \div 3$

$p = \frac{r-2t}{3}$ ✓ or $p = \frac{1}{3}(r-2t)$

2)

Change the subject of the formula

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

to L. **2**

$P = 2(L+B)$

$\div 2 \quad \div 2$

$\frac{P}{2} = L + B$ ✓

$-B \quad -B$

$\frac{P}{2} - B = L$ ✓

OR //

$P = 2(L+B)$

$P = 2L + 2B$

$-2B \quad -2B$

$P - 2B = 2L$ ✓

$\div 2 \quad \div 2$

$\frac{P-2B}{2} = L$ ✓

3) $P = R^2b - 5$

Change the subject of the formula to R. **3**

$$P = R^2 b - 5$$

$+5 \qquad +5$

$$R^2 b = P + 5 \quad ✓$$

$\div b \qquad \div b$

$$R^2 = \frac{P+5}{b} \quad ✓$$

$\surd \qquad \surd$

$$R = \sqrt{\frac{P+5}{b}} \quad ✓$$

4)

Change the subject of the formula $m = \frac{3x+2y}{p}$ to x. **3**

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

$\times p$ $\quad$ $\times p$

$$mp = 3x + 2y \checkmark$$

$-2y$ $\quad$ $-2y$

$$3x = mp - 2y \checkmark$$

$\div 3$ $\quad$ $\div 3$

$$x = \frac{mp-2y}{3} \checkmark \text{ or } x = \frac{1}{3}(mp-2y)$$

5)

Change the subject of the formula

$$\frac{x}{c} + a = b$$

to x. 2

$\frac{x}{c} + a = b$ or $\frac{x}{c} + a = b$

$\times c \quad \times c \quad \times c$ $\quad -a \quad -a$

$x + ac = bc$ ✓ $\quad \frac{x}{c} = b - a$ ✓

$-ac \quad -ac$ $\quad \times c \quad \times c$

$x = bc - ac$ ✓ $\quad x = c(b-a)$ ✓

6)

Change the subject of the formula

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

to h. **2**

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

$\times 2$ $\times 2$

$$2A = h(a+b)$$ ✓

$\div(a+b)$ $\div(a+b)$

$$h = \frac{2A}{a+b}$$ ✓

7)

Change the subject of the formula

$$K = \frac{m^2 n}{p}$$

to m. **3**

$$K = \frac{m^2 n}{p}$$

$\times p$ $\quad$ $\times p$

$$Kp = m^2 n \quad \checkmark$$

$\div n$ $\quad$ $\div n$

$$m^2 = \frac{Kp}{n} \quad \checkmark$$

$\surd$ $\quad$ $\surd$

$$m = \sqrt{\frac{Kp}{n}} \quad \checkmark$$

8)

A formula used to calculate lighting efficiency is

$$E = \frac{I}{D^2}.$$

Change the subject of this formula to D. **3**

$$E = \frac{I}{D^2}$$

$\times D^2 \qquad \times D^2$

$$ED^2 = I \quad \checkmark$$

$\div E \qquad \div E$

$$D^2 = \frac{I}{E} \quad \checkmark$$

$$D = \sqrt{\frac{I}{E}} \quad \checkmark$$

9)

Change the subject of the formula

$$p = q + \sqrt{a}$$

to a. **2**

$p = q + \sqrt{a}$

$-q \quad -q$

$\sqrt{a} = p - q$ ✓

sq sq

$a = (p - q)^2$ ✓

sq sq

$25 = (2 + 3)^2$ X

10)

Change the subject of the formula $s = ut + \frac{1}{2}at^2$ to a. 3

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

$\times 2 \quad \times 2 \quad \times 2$

$$2s = 2ut + at^2 \quad \checkmark$$

$-2ut \quad -2ut$

$$at^2 = 2s - 2ut \quad \checkmark$$

$\div t^2 \quad \div t^2$

$$a = \frac{2s - 2ut}{t^2} \quad \checkmark$$

11)

Change the subject of the formula $L = \sqrt{4kt - p}$ to k. 3

$$L = \sqrt{4kt - p}$$

sq sq

$$L^2 = 4kt - p \quad \checkmark$$

+p +p

$$4kt = L^2 + p \quad \checkmark$$

÷4t ÷4t

$$k = \frac{L^2 + p}{4t} \quad \checkmark$$

12)

Change the subject of the formula $F = \frac{t^2 + 4b}{c}$ to b. 3

$$F = \frac{t^2 + 4b}{c}$$

$\times c$ $\times c$

$$Fc = t^2 + 4b \quad \checkmark$$

$-t^2$ $-t^2$

$$4b = Fc - t^2 \quad \checkmark$$

$\div 4$ $\div 4$

$$b = \frac{Fc - t^2}{4} \quad \checkmark$$