

Quick Test - Rearranging formulae



1. Make s the subject of the formula $p = s + tu$

(1 mark)

$$\begin{aligned}
 & \xrightarrow{-tu} \quad \xrightarrow{-tu} \\
 p - tu &= s \\
 s &= p - tu
 \end{aligned}$$

2. Make t the subject of the formula $p = s + tu$

(1 mark)

$$\begin{aligned}
 & \xrightarrow{-s} \quad \xrightarrow{-s} \\
 p - s &= tu \\
 \div u & \quad \div u \\
 \frac{p-s}{u} &= t
 \end{aligned}$$

3. Make s the subject of the formula $p = s^2 + 4tu$

(2 marks)

$$\begin{aligned}
 & \xrightarrow{-4tu} \quad \xrightarrow{-4tu} \\
 p - 4tu &= s^2 \\
 \sqrt{\quad} & \quad \sqrt{\quad} \\
 \sqrt{p - 4tu} &= s
 \end{aligned}$$

4. Make t the subject of the formula $p^2 = s^2 + 4tu$

(2 marks)

$$\begin{aligned}
 & \xrightarrow{-s^2} \quad \xrightarrow{-s^2} \\
 p^2 - s^2 &= 4tu \\
 \div 4u & \quad \div 4u \\
 \frac{p^2 - s^2}{4u} &= t
 \end{aligned}$$

$$t = \frac{p^2 - s^2}{4u}$$

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5. Make t the subject of the formula $v = \frac{1}{6}t + 6w$

(2 marks)

$$\begin{aligned}
 & -6w && -6w \\
 \times 6 & v - 6w = \frac{1}{6}t && +6 \\
 & \underline{6(v - 6w)} = t
 \end{aligned}$$

6. Make w the subject of the formula $v = 0.2t + 5w^2$

(2 marks)

$$\begin{aligned}
 & -0.2t && -0.2t \\
 & v - 0.2t = 5w^2 \\
 \div 5 & \sqrt{\frac{v - 0.2t}{5}} = w && \div 5
 \end{aligned}$$

7. Make a the subject of the formula $P = r + 2r + 2a$

(2 marks)

$$\begin{aligned}
 & -r && -r \\
 & P - r = 2r + 2a && -2r \\
 -2r & && \\
 \underline{P - r - 2r} & = a
 \end{aligned}$$

8. Make a the subject of the formula $3a + b = x(a + c)$

(3 marks)

$$\begin{aligned}
 & 3a + b = ax + cx && -ax \\
 -ax & 3a - ax + b = cx && -b \\
 -b & 3a - ax = cx - b && \\
 & a(3 - x) = cx - b && \Rightarrow a = \frac{cx - b}{3 - x}
 \end{aligned}$$

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9. Make b the subject of the formula $b(3 + d) = x(b + c)$

(2 marks)

$$\begin{aligned} 3b + bd &= xb + xc \\ 3b + bd - xb &= xc \\ b(3 + d - x) &= xc \\ b &= \frac{xc}{3 + d - x} \end{aligned}$$

10. Make c the subject of the formula $b(3 + cd) = x(b + c)$

(3 marks)

$$\begin{aligned} 3b + bcd &= bx + cx \\ bcd - cx &= bx - 3b \\ c(bd - x) &= bx - 3b \\ c &= \frac{bx - 3b}{bd - x} \end{aligned}$$

11. Make y the subject of the formula $3(y + 2) = a(5 - 2y)$

(3 marks)

$$\begin{aligned} 3y + 6 &= 5a - 2ay \\ 3y + 2ay &= 5a - 6 \\ y(3 + 2a) &= 5a - 6 \\ y &= \frac{5a - 6}{3 + 2a} \end{aligned}$$

12. Make p the subject of the formula $x \frac{p+5}{p+6}$

(3 marks)

$$\begin{aligned} x(p+6) &= (p+5) \\ xp + 6x &= p + 5 \\ xp - p &= 5 - 6x \\ p(x-1) &= 5 - 6x \end{aligned} \quad \rightarrow \quad p = \frac{5 - 6x}{x - 1}$$

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13. Make p the subject of the formula $\frac{x}{1} = \frac{p+5}{p-t}$

(3 marks)

$$\begin{aligned}
 x(p-t) &= p+5 \\
 px - xt &= p+5 \\
 px - p &= 5 + xt \\
 p(x-1) &= 5 + xt \\
 p &= \frac{5+xt}{x-1}
 \end{aligned}$$

14. Make x the subject of the formula $\frac{a}{c} \times \frac{5x}{x+6}$

(3 marks)

$$\begin{aligned}
 a(x+6) &= c(5x) \\
 ax + 6a &= 5cx \\
 ax - 5cx &= -6a \\
 x(a-5c) &= -6a \\
 x &= \frac{-6a}{a-5c} \\
 6a &= 5cx - ax \\
 6a &= x(5c-a) \\
 \frac{6a}{5c-a} &= x
 \end{aligned}$$

15. Make y the subject of the formula $\frac{a}{2c} \times \frac{5y}{y+6}$

(3 marks)

$$\begin{aligned}
 a(y+6) &= 2c(5y) \\
 ay + 6a &= 10cy \\
 6a &= 10cy - ay \\
 6a &= y(10c-a) \\
 \frac{6a}{10c-a} &= y
 \end{aligned}$$

16. Make z the subject of the formula $\frac{a}{c} = \frac{4+5yz}{3y-3}$

(3 marks)

$$\begin{aligned}
 a(3y-3) &= c(4+5yz) \\
 3ay - 3a &= 4c + 5cyz \\
 3ay - 3a - 4c &= 5cyz \\
 \frac{3ay - 3a - 4c}{5cy} &= z
 \end{aligned}$$

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17. Make u the subject of the formula $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$ (3 marks)

$$\begin{aligned} \frac{1}{f} &= \frac{1}{u} + \frac{1}{v} \\ \frac{1}{f} &= \frac{v+u}{uv} \end{aligned} \quad \begin{aligned} &\rightarrow uv = f(v+u) \\ &uv = fv + fu \\ &uv + fu = fv \\ &u(v+f) = fv \end{aligned} \quad \rightarrow u = \frac{fv}{v+f}$$

18. Make h the subject of the formula $m = \sqrt{\frac{2h+1}{3}}$ (3 marks)

$$\begin{aligned} m &= \sqrt{\frac{2h+1}{3}} \\ 3m^2 &= 2h+1 \\ 3m^2 - 1 &= 2h \end{aligned} \quad \rightarrow \quad \frac{3m^2 - 1}{2} = h$$

19. Express a in terms of b and c . $5(2a + b) = a + b + c$ (3 marks)

$$\begin{aligned} 10a + 5b &= a + b + c \\ 9a + 5b &= b + c \\ 9a &= b + c - 5b \\ a &= \frac{b + c - 5b}{9} \end{aligned}$$

20. Make y the subject of the formula $x = z - 3wy^3$ (3 marks)

$$\begin{aligned} 3wy^3 + x &= z \\ 3wy^3 &= z - x \\ y^3 &= \frac{z-x}{3w} \end{aligned} \quad \rightarrow \quad y = \sqrt[3]{\frac{z-x}{3w}}$$

Total

/50 marks