



2.5 – Rearranging formulae

Student name: _____ Score: _____

1. Write the following as algebraic expressions.

(a) One-third of the sum of p and q .

$$\frac{p + q}{3} \dots\dots\dots [1]$$

(b) The square root of the product of x and y .

$$\sqrt{xy} \dots\dots\dots [1]$$

2. Make t the subject of the formula.

$$y = \frac{a}{t - 2}$$

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

3. $\frac{d}{x - c} = \frac{x + c}{d}$

Find x in terms of c and d .

$$x = \sqrt{c^2 + d^2} \dots\dots\dots [3]$$

4. The area of a semicircle is given by the formula

$$A = \frac{\pi r^2}{2}.$$

Make r the subject of the formula.

$$r = \sqrt{\frac{2A}{\pi}} \dots\dots\dots [3]$$

5. Rearrange this equation to make x the subject.

$$ax - 3y = b(x + 2y)$$

$$x = \frac{y(2b - 3)}{(a - b)} \dots\dots\dots [3]$$

6. Make x the subject of the formula $y = ax^3$.

$$x = \sqrt[3]{\frac{y}{a}} \dots\dots\dots [2]$$

7. $v = u + at$

Rearrange the formula to write t in terms of a , u and v .

$$t = \frac{v - u}{a} \dots\dots\dots [2]$$

8. Make x the subject of the equation.

$$\frac{a}{x + 3} = \frac{b}{x}$$

$$x = \frac{3b}{(a - b)} \dots\dots\dots [3]$$

9. $v = u + at$

(a) Find the value of v when $u = 12$, $a = -2$ and $t = 5$.

$$2 \dots\dots\dots [1]$$

(b) Rearrange the formula to make a the subject.

$$a = \frac{v - u}{t} \dots\dots\dots [2]$$



10. Make u the subject of the formula.

$$v^2 = u^2 + 2as$$

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

11. $v = u + at$

(a) Find v when $u = 5$, $a = -1$ and $t = 1.5$.

$$v = 3.5 \dots\dots\dots [2]$$

(b) Rearrange the formula to write a in terms of t , u and v .

$$a = \frac{v - u}{t} \dots\dots\dots [2]$$

12. (a) Use the formula $A = \frac{h}{2}(x + y)$ to find the value of A when $x = 7$, $y = 13$ and $h = 6.4$.

$$A = 64 \dots\dots\dots [2]$$

(b) Rearrange the formula to make x the subject.

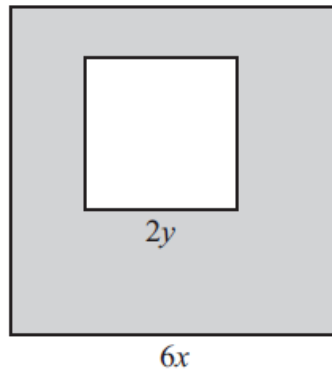
$$x = \frac{2A}{h} - y \text{ or } \frac{2A - hy}{h} \dots\dots\dots [3]$$

13. $t = \frac{1}{p^2}$

Rearrange the formula to write p in terms of t .

$$p = \sqrt{\frac{1}{t}} \dots\dots\dots [2]$$

14.



A small square of side $2y$ is inside a larger square of side $6x$.

(a) Find an expression for the shaded area, A , in terms of x and y .

$$A = 36x^2 - 4y^2 \dots\dots\dots [2]$$

(b) Rearrange your answer to part (a) to write x in terms of y and A .

$$x = \sqrt{\frac{A + 4y^2}{36}} \dots\dots\dots [3]$$

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

Find s in terms of a , u and v .

$$s = \frac{u^2 - v^2}{2a} \dots\dots\dots [2]$$

16. $v = \frac{uf}{u-f}$

(a) Find the value of v when $u = 30$ and $f = 10$.

$$v = 15 \dots\dots\dots [2]$$

(b) Rearrange the formula to make f the subject.

$$f = \frac{uv}{u + v} \dots\dots\dots [3]$$



17. Rearrange this formula to make x the subject.

$$y = \frac{ax}{bx+c}$$

$$x = \frac{cx}{a-by} \dots\dots\dots [3]$$

18. Rearrange this formula to make b the subject.

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

$$b = \frac{2A}{h} - a \text{ or } \frac{2A - ah}{h} \dots\dots\dots [3]$$

19. $t = 3p^2$

(a) Find the value of t when $p = 4$.

$$t = 48 \dots\dots\dots [1]$$

(b) Re-arrange the formula to write p in terms of t .

$$p = \sqrt{\frac{t}{3}} \dots\dots\dots [2]$$

20. Make a the subject of $s = ut + \frac{1}{2}at^2$.

$$a = \frac{2s - 2ut}{t^2} \dots\dots\dots [3]$$

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

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

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

22. Rearrange the formula to make x the subject.

$$y(x+4) = 2$$

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

23. Rearrange this equation to make x the subject.

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

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

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

Rearrange the formula to make x the subject.

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

25. Find the value of $x^2 - x$ when $x = -3$.

$$12 \dots\dots\dots [1]$$

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

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

$$y = 2x^2 - 1$$

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

27. Rearrange the formula to write x in terms of y .

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



28. Rearrange the formula to make x the subject.

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

$$x = \frac{5A}{2A-3} \quad \text{or} \quad \frac{-5A}{3-2A} \quad [3]$$

29. $y = mx + c$

(a) Find y when $m = \frac{1}{2}$, $x = -2$ and $c = 4$.

$$y = 3 \quad [2]$$

(b) Rearrange the formula to write m in terms of x , y and c .

$$m = \frac{y-c}{x} \quad [2]$$

30. Make l the subject of the formula $T = 2\pi\sqrt{\frac{l}{g}}$.

$$l = g\left(\frac{T}{2\pi}\right)^2 \quad \text{or} \quad \frac{gT^2}{4\pi^2} \quad [3]$$

31. Rearrange the formula to make x the subject.

$$y = 1 - \frac{x}{3x-5}$$

$$x = \frac{5y-5}{3y-2} \quad \text{or} \quad x = \frac{5-5y}{2-3y} \quad [4]$$

32. Rearrange this formula to make a the subject.

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

$$\frac{y-2}{y-3} \quad [3]$$

33. $v = u + at$

(a) Find v when $u = 5$, $a = -3$ and $t = 4$.

$$v = -7 \quad [2]$$

(b) Rearrange the formula to make u the subject.

$$u = v - at \quad [1]$$

34. $J = m(k^2 + h^2)$

Rearrange the formula to make h the subject.

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

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

Rearrange the formula to make w the subject.

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

36. $P = 2a + b^2 - 3c$

Find P when $a = 5$, $b = -4$ and $c = -3$.

$$P = 35 \quad [2]$$

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

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

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

