GCSE Mathematics

Rearranging Formulae

Questions

Pearson Edexcel GCSE & iGCSE Mathematics

Section A — Foundation

Worked Examples

[Fluency]

Make x the subject of y = 3x + 2

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

[Reasoning]

Make r the subject of A = πr²

$$\frac{A}{\pi} = r^2 \Rightarrow r = \sqrt{\frac{A}{\pi}}$$

[Problem Solving]

Make l the subject of P = 2l + 2w

$$P - 2w = 2l \Rightarrow l = \frac{P-2w}{2}$$

[Fluency]

1. Make x the subject of: y = 3x + 2

(2 marks)

[Fluency]

2. Make r the subject of: A = πr²

(2 marks)

[Fluency]

3. Make l the subject of: P = 2l + 2w

(2 marks)

[Fluency]

4. Make t the subject of: v = u + at

(2 marks)

[Fluency]

5. Make b the subject of: A = ½bh

(2 marks)

[Reasoning]

6.

The formula for kinetic energy is E = ½mv².
Make v the subject of this formula.

(3 marks)

[Reasoning]

7.

The formula for the volume of a cylinder is $V = \pi r^2 h$.

Make h the subject.

Hence find h when $V = 50\pi$ and $r = 5$.

(4 marks)

[Reasoning]

8.

Rearrange to make x the subject: $3x - 2y = 5x + 4$

(3 marks)

[Problem Solving]

9.

Make u the subject of: $v^2 = u^2 + 2as$

(3 marks)

[Problem Solving]

10.

The surface area of a sphere is $S = 4\pi r^2$.

Make r the subject. (2)

Find the radius of a sphere with surface area 100 cm^2. Give your answer to 2 d.p. (2)

(4 marks)

Section B — Higher

Worked Examples

[Fluency]

Make x the subject of: ax + b = cx + t

$$ax - cx = t - b \Rightarrow x(a - c) = t - b \Rightarrow x = \frac{t - b}{a - c}$$

[Reasoning]

Make x the subject of: y = (x+a)/(x–b)

$$y(x - b) = x + a \Rightarrow yx - yb = x + a \Rightarrow x(y - 1) = a + yb \Rightarrow x = \frac{a + by}{y - 1}$$

[Problem Solving]

Make u the subject of: 1/f = 1/u + 1/v

$$\frac{1}{u} = \frac{1}{f} - \frac{1}{v} = \frac{v - f}{fv} \Rightarrow u = \frac{fv}{v - f}$$

[Fluency]

1.

Make x the subject of: ax + b = cx + t

(3 marks)

[Fluency]

2.

Make x the subject of: $y = \frac{x + a}{x - b}$

(4 marks)

[Fluency]

3.

Make u the subject of: $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

(4 marks)

[Reasoning]

4.

Make x the subject of: $\sqrt{x + a} = b$

(3 marks)

[Reasoning]

5.

Make r the subject of: $A = \frac{1}{2}r^2\theta$

(3 marks)

[Reasoning]

6.

Make x the subject of: $\frac{x}{a} + \frac{x}{b} = 1$

(4 marks)

[Reasoning]

7.

Make t the subject of: $s = ut + \frac{1}{2}at^2$

Note: there are two values of t — find both.

(5 marks)

[Problem Solving]

8.

Make x the subject of: $y = \frac{2x+3}{x-1}$

(4 marks)

[Problem Solving]

9.

Make x the subject of: $\frac{x+1}{x-2} = \frac{a}{b}$

(4 marks)

[Problem Solving]

10.

The formula for the period of a pendulum is:

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

Make l the subject.

Find l when T = 2 and g = 9.8. Give your answer to 3 s.f.

(5 marks)