

4.2 Solutions (4.1 Optional Exit)

GCSE Mathematics Algebra, Rearranging Formulae

Answer 1

$$(i) \quad x = \sqrt{m} - 17$$

$$(ii) \quad x = \frac{k}{23}$$

$$(iii) \quad x = 5v^2$$

$$(iv) \quad x = \frac{8}{11}$$

[4 marks]

Answer 2

$$(i) \quad \frac{3}{5}$$

$$(ii) \quad \frac{\sin(x)}{4x^2}$$

$$(iii) \quad \frac{1}{7}$$

$$(iv) \quad 2$$

$$(v) \quad \sqrt{5}$$

$$(vi) \quad \frac{1}{\pi}$$

$$(vii) \quad \frac{1}{8 + 3k}$$

$$(viii) \quad \frac{5p}{3 + v^2}$$

$$(ix) \quad \frac{\pi}{2 + \arcsin(x)}$$

[9 marks]

Answer 4

$$ax - 8\sqrt{n^2 + 1} = 5k$$

$$ax = 5k + 8\sqrt{n^2 + 1}$$

$$x = \frac{5k + 8\sqrt{n^2 + 1}}{a}$$

Answer 5

$$\sqrt{3}x - 7 = \sin(z) + y$$

$$\sqrt{3}x = \sin(z) + y + 7$$

$$x = \frac{\sin(z) + y + 7}{\sqrt{3}}$$

[3, 3 marks]

Answer 6

$$6(4x + p) = 13$$

$$24x + 6p = 13$$

$$24x = 13 - 6p$$

$$x = \frac{13 - 6p}{24}$$

Answer 7

$$\frac{x}{4} + 12a = 7c$$

$$\frac{x}{4} = 7c - 12a$$

$$x = 28c - 48a$$

[3, 3 marks]

Answer 8

$$5p + 4v = \sqrt{\sin(m)}$$

$$5p = \sqrt{\sin(m)} - 4v$$

$$p = \frac{\sqrt{\sin(m)} - 4v}{5}$$

[3 marks]

Answer 9

$$(i) \quad x + m^2 = v^2 + \frac{1}{c}$$

$$x = v^2 + \frac{1}{c} - m^2$$

$$(ii) \quad \frac{x}{8 \cos(\sqrt{k})} = f$$

$$x = 8f \cos(\sqrt{k})$$

$$(iii) \quad \frac{1}{x} = \frac{m + 3\sqrt{k}}{z + 8}$$

$$\frac{x}{1} = \frac{z + 8}{m + 3\sqrt{k}}$$

$$x = \frac{z + 8}{m + 3\sqrt{k}}$$

$$(iv) \quad \frac{1}{x} = a^2 + b^2 - 5$$

$$\frac{x}{1} = \frac{1}{a^2 + b^2 - 5}$$

$$x = \frac{1}{a^2 + b^2 - 5}$$

[4 marks]**Answer 10**

$$w - \frac{2v}{p} = m^2$$

$$w = m^2 + \frac{2v}{p}$$

[2 marks]**Answer 11**

$$\frac{4}{x} + 5k = 7m$$

$$\frac{4}{x} = 7m - 5k$$

$$\frac{x}{4} = \frac{1}{7m - 5k}$$

$$x = \frac{4}{7m - 5k}$$

Answer 12

$$\frac{7f}{x} + 4 = \sin(w)$$

$$\frac{7f}{x} = \sin(w) - 4$$

$$\frac{x}{7f} = \frac{1}{\sin(w) - 4}$$

$$x = \frac{7f}{\sin(w) - 4}$$

[3, 3 marks]**Answer 13**

$$\frac{1}{x + 5p} = \frac{a^2}{7 + b}$$

$$x + 5p = \frac{7 + b}{a^2}$$

$$x = \frac{7 + b}{a^2} = 5p$$

Answer 14

$$\frac{3 + m}{x} - 4km = u^2$$

$$\frac{3 + m}{x} = u^2 + 4km$$

$$\frac{x}{3 + m} = \frac{1}{u^2 + 4km}$$

$$x = \frac{3 + m}{u^2 + 4km}$$

[3, 3 marks]

Answer 15

$$\frac{4}{5z^3 + x} - 3h = g - 1$$

$$\frac{4}{5z^3 + x} = g - 1 + 3h$$

$$\frac{5z^3 + x}{4} = \frac{1}{g - 1 + 3h}$$

$$5z^3 + x = \frac{4}{g - 1 + 3h}$$

$$x = \frac{4}{g - 1 + 3h} - 5z^3$$

Answer 16

$$\sqrt{x + 1} = z + 3$$

$$x + 1 = (z + 3)^2$$

$$x = (z + 3)^2 - 1$$

[3, 3 marks]

Answer 17

$$(x - 5)^2 = m$$

$$x - 5 = \pm \sqrt{m}$$

$$x = 5 \pm \sqrt{m}$$

Answer 18

$$\frac{1}{\sqrt{x}} = \frac{3}{8}$$

$$\frac{\sqrt{x}}{1} = \frac{8}{3}$$

$$\sqrt{x} = \frac{8}{3}$$

square both sides

$$x = \frac{64}{9}$$

[3, 3 marks]