

Name:

Level 2 Further Maths



Changing the Subject

Corbettmaths

Ensure you have: Pencil or pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Revision for this topic

www.corbettmaths.com/more/further-maths/



1. Rearrange $w = a - 4c^3$ to make c the subject

$$w + 4c^3 = a$$

$$4c^3 = a - w$$

$$c^3 = \frac{a-w}{4}$$

$$c = \sqrt[3]{\frac{a-w}{4}}$$

.....
(2)

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2. (a) Rearrange $d = \sqrt{ab+3}$ to make a the subject

$$d^2 = ab + 3$$

$$d^2 - 3 = ab$$

$$\frac{d^2 - 3}{b} = a$$

$$a = \frac{d^2 - 3}{b}$$

.....
(3)

- (b) Work out the value of b when $d = 16$ and $a = 4$

$$16 = \sqrt{4b+3}$$

$$256 = 4b + 3$$

$$253 = 4b$$

$$b = \frac{253}{4}$$

b =
(2)

$$b = 63.25$$

3. Make h the subject of $m = 18 - (h - 3)^2$

$$m + (h - 3)^2 = 18$$

$$(h - 3)^2 = 18 - m$$

$$h - 3 = \pm \sqrt{18 - m}$$

$$h = \pm \sqrt{18 - m} + 3$$

$$h = 3 \pm \sqrt{18 - m}$$

.....
(4)

4. Rearrange $y = \frac{5(x + w)}{w}$ to make w the subject

$$wy = 5x + 5w$$

$$wy - 5w = 5x$$

$$w(y - 5) = 5x$$

$$w = \frac{5x}{y - 5}$$

.....
(4)

5. (a) Make r the subject of the formula $3r - 1 = 5v(2r + 3)$

$$3r - 1 = 10rv + 15v$$

$$3r - 10rv = 15v + 1$$

$$r(3 - 10v) = 15v + 1$$

$$r = \frac{15v + 1}{3 - 10v}$$

.....
(4)

- (b) Work out the value of r when $v = -0.5$

$$r = \frac{-7.5 + 1}{3 + 5}$$

$$r = \frac{-6.5}{8}$$

$$r = -0.8125 \left(-\frac{13}{16}\right)$$

.....
(3)

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6. Given $a^2 = b^2 + c^2 - 2bc \cos A$

Show that $\cos A = \frac{b^2 + c^2 - a^2}{2bc}$

$$a^2 + 2bc \cos A = b^2 + c^2$$

$$2bc \cos A = b^2 + c^2 - a^2$$

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

(3)

7. Make m the subject of $x = \frac{3}{k-m}$

$$x(k-m) = 3$$

$$kx - mx = 3$$

$$kx = 3 + mx$$

$$kx - 3 = mx$$

$$\frac{kx-3}{x} = m \quad \text{or} \quad m = k - \frac{3}{x}$$

.....
(3)

8. Make x the subject of $y = \sqrt{\frac{x-4}{x+1}}$

$$y^2 = \frac{x-4}{x+1}$$

$$y^2(x+1) = x-4$$

$$xy^2 + y^2 = x-4$$

$$xy^2 + 4 = x - xy^2$$

$$y^2 + 4 = x(1-y^2)$$

$$x = \frac{y^2+4}{1-y^2}$$

$$\text{or} \quad x = \frac{y^2+4}{(1-y)(1+y)}$$

.....
(5)

9. Make m the subject of $y = \frac{2m + 1}{9 - m}$

$$y(9 - m) = 2m + 1$$

$$9y - my = 2m + 1$$

$$9y - 1 = 2m + my$$

$$9y - 1 = m(2 + y)$$

$$\frac{9y - 1}{2 + y} = m \quad \text{or} \quad m = \frac{9y - 1}{y + 2}$$

(4)

10. Make y the subject of $\frac{x - 3y}{y + x} = p$

$$\frac{x - 3y}{y + x} = p$$

$$x - 3y = p(y + x)$$

$$x - 3y = py + px$$

$$x - px = py + 3y$$

$$x - px = y(p + 3)$$

$$y = \frac{x - px}{p + 3}$$

(4)

11. Make h the subject of $\sqrt{\frac{r+h}{4rh}} = v$

$$\frac{r+h}{4rh} = v^2$$

$$r+h = 4v^2 rh$$

$$r = 4hr^2 r - h$$

$$r = h(4v^2 r - 1)$$

$$h = \frac{r}{4v^2 r - 1}$$

.....
(4)

12. Make x the subject of $y = \frac{4x^3 - 9}{2x^3 + w}$

$$2x^3 y + wy = 4x^3 - 9$$

$$wy + 9 = 4x^3 - 2x^3 y$$

$$wy + 9 = x^3 (4 - 2y)$$

$$x^3 = \frac{wy + 9}{4 - 2y}$$

$$x = \sqrt[3]{\frac{wy + 9}{4 - 2y}}$$

.....
(5)

13. Make q the subject of $\frac{p}{qr} = 2 + \frac{1}{r}$

$$\frac{p}{qr} - \frac{1}{r} = 2$$

$$\frac{p}{qr} - \frac{q}{qr} = 2$$

$$\frac{p-q}{qr} = 2$$

$$p-q = 2qr$$

$$p = 2qr + q$$

$$p = q(2r + 1)$$

$$q = \frac{p}{2r+1}$$

.....
(4)

14. Make c the subject of $\frac{5}{a} + \frac{b}{2} - \frac{7}{c} = 0$

$$\frac{10c}{2ac} + \frac{abc}{2ac} - \frac{14a}{2ac} = 0$$

$$\frac{10c + abc - 14a}{2ac} = 0$$

$$10c + abc - 14a = 0$$

$$10c + abc = 14a$$

$$c(10 + ab) = 14a$$

$$c = \frac{14a}{10 + ab}$$

.....
(5)