



## Harder Rearranging a Formula Exam Practice

Q1. Make  $a$  the subject of the formula,  $a(b + 1) = d$  (1 mark)

Q2. Make  $b$  the subject of the formula,  $\frac{a}{b-1} = d$  (2 marks)

Q3. Make  $q$  the subject of the formula,  $p + \sqrt{q + 2} = r$  (2 marks)

Q4. Make  $u$  the subject of the formula,  $\frac{1}{\sqrt[3]{u-2}} = 8v + 3$  (3 marks)

Q5. Make  $a$  the subject of the formula,  $s = vt - \frac{1}{2}at^2$  (2 marks)

Q6. Make  $d$  the subject of the formula,  $\frac{1}{c} + \frac{1}{d} = \frac{1}{e}$  (4 marks)

### Multiple copies of the subject letter

Q7. Make  $x$  the subject of the formula,  $3(x + a) = x + b$  (1 mark)

Q8. Make  $p$  the subject of the formula,  $a(2p - q) = p + 1$  (2 marks)

Q9. Make  $r$  the subject of the formula,  $\frac{2r+s}{3r} = 4$  (3 marks)

Q10. Make  $c$  the subject of the formula,  $\frac{2c+1}{3c-5} = 4$  (3 marks)

Q11. Make  $m$  the subject of the formula,  $\frac{2(3m-3)}{3m-5} = 4$  (4 marks)

Q12. Make  $m$  the subject of the formula,  $e = mgh + \frac{1}{2}mv^2$  (3 marks)

Q13. Here is a formula:  $\frac{3x-2}{5} - \frac{3y-2}{5y} = 0$   
(a) make  $x$  the subject (2 marks)

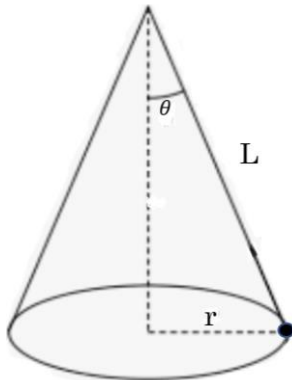


(b) make  $y$  the subject

(3 marks)

### Applied Mixed Practice Problems

Q14. A marble is attached to the end of a string of length  $L$  cm which is held at angle  $\theta$  to the vertical. On being given a horizontal force, the marble follows the path of a circle as shown below.



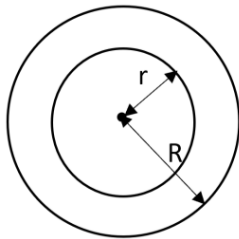
The number of seconds  $t$  to complete a circle, is given by:

$$t = 2\pi \sqrt{\frac{L \cos(\theta)}{g}}$$

If the marble takes 4 seconds to complete a circle, the string is of length 30 cm,  $g = 9.8$ , work out the angle between the string and the vertical to 1 d.p.

(3 marks)

Q15.



Here is an annulus.

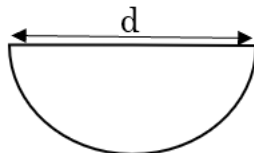
a) Find a formula for the area  $A$  of the annulus in terms of  $r$  and  $R$ .

(2 marks)

b) Find a formula for  $r$  in terms of  $A$  and  $R$

(2 marks)

Q16. Here is a semi-circle, with diameter  $d$ , radius  $r$ :



a) Find a formula for the circumference  $c$  of the shape in terms of  $d$

(2 marks)

b) Hence or otherwise, find a formula for  $r$  in terms of the circumference  $c$

(2 marks)

Q17. Amit works in a bank. He uses the formula  $F = P\alpha(1 + r)^n$  where  $F$  is the future value of an investment,  $P$  is its present value,  $r$  is the annual interest rate and  $\alpha$  is a number between 0 and 1 which reflects the current confidence the bank has in its forecasts.

a) Find a formula for the interest rate.

(3 marks)

b)(i) Amit has set the confidence coefficient to 0.3.

If a customer's investment is worth £24,000 now and is to be worth £25,30 find the interest rate the bank will have to apply. (2 marks)



- (ii) Suppose that Amit sets the confidence coefficient to 0.43. State whether  $r$  will have to increase or decrease compared to the previous value of  $\alpha$ . (1 mark)

