

1.

[2 marks]

Make  $r$  the subject of the formula  $A = 4\pi r^2$  where  $r$  is positive.

$r = \dots\dots\dots$

2.

[2 marks]

Make  $a$  the subject of  $P = \sqrt{ab}$

$a = \dots\dots\dots$

3.

[2 marks]

Make  $W$  the subject of the formula  $h = \sqrt{\frac{W}{I}}$

$W = \dots\dots\dots$



4.

[2 marks]

The formula for the curved surface area,  $A$ , of a cylinder is

$$A = 2\pi rh$$

where  $r$  is the radius and  $h$  is the height.

Calculate the value of  $r$  when  $A = 19.8$  and  $h = 2.1$

Give your answer correct to one decimal place.

$$A = \dots\dots\dots$$

5.

[3 marks]

Make  $x$  the subject of  $3x - y = x + 7$

$$x = \dots\dots\dots$$

6.

[2 marks]

Make  $h$  the subject of the formula  $A = 2\pi r(r + h)$

$$h = \dots\dots\dots$$



7.

[3 marks]

Make  $y$  the subject of  $3(y + 2x - 1) = x + 5y$

$y =$  .....

8.

[3 marks]

Make  $t$  the subject of  $5(t - g) = 2t + 7$

.....





Diagram **NOT**  
accurately drawn

The diagram shows a fish bowl.  
The water surface is a circle with a diameter of 16 cm.

- (a) Work out the area of a circle with a diameter of 16 cm.  
Give your answer correct to 3 significant figures.

..... cm<sup>2</sup>  
(2)

- (b) The volume of water,  $V$  cm<sup>3</sup>, in the fish bowl may be found using the formula

$$V = \frac{1}{6} \pi h (3x^2 + 3y^2 + h^2)$$

Find the value of  $V$  when  $h = 16.4$   
 $x = 6.5$   
and  $y = 8$

Give your answer correct to 3 significant figures.

$V =$  .....  
(2)



$$I = kT^4$$

$$k = 5.67 \times 10^{-8}$$

$$T = 5800$$

(a) Work out the value of  $I$ .

Give your answer in standard form correct to 3 significant figures.

$$I = \dots\dots\dots$$

(2)

(b) Rearrange the formula  $I = kT^4$  to make  $T$  the subject.

$$\dots\dots\dots$$

(2)

Make  $v$  the subject of the formula  $m(v - u) = I$

$$v = \dots\dots\dots$$



12.

[3 marks]

Make  $r$  the subject of the formula  $A = 4r^2 - \pi r^2$  where  $r$  is positive.

$r = \dots\dots\dots$

13.

[5 marks]

Given that  $y$  is positive, make  $y$  the subject of  $y = \sqrt{ay^2 + n}$

Show clear algebraic working.

$y = \dots\dots\dots$



14.

[4 marks]

Make  $n$  the subject of the formula

$$t = \sqrt{\frac{n+3}{n}}$$

$n = \dots\dots\dots$

15.

[4 marks]

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

$\dots\dots\dots$



$$T = \frac{n(1+e)}{(1-e)}$$

- (a) Work out the value of  $T$  when  $n = 8.6$  and  $e = 0.2$

$$T = \dots\dots\dots$$

(2)

- (b) Make  $e$  the subject of the formula  $T = \frac{n(1+e)}{(1-e)}$

$$e = \dots\dots\dots$$

(5)





17.

[4 marks]

Make  $t$  the subject of the formula  $m = \frac{t + 1}{t - 3}$

18.

[3 marks]

Make  $g$  the subject of  $3e + 4g = 7 + 9eg$



19.

[4 marks]

Make  $x$  the subject of  $P = \frac{100(y-x)}{x}$

$x = \dots\dots\dots$

20.

[4 marks]

Make  $R$  the subject of the formula  $A = \pi(R+r)(R-r)$

$R = \dots\dots\dots$



$$y = at^2 - 2at$$

$$x = 2a\sqrt{t}$$

Express  $y$  in terms of  $x$  and  $a$ .

Give your answer in the form

$$y = \frac{x^p}{ma^3} - \frac{x^q}{na}$$

where  $p$ ,  $q$ ,  $m$  and  $n$  are integers.

.....



Make  $y$  the subject of  $\frac{y}{x} + \frac{2y}{x+4} = 3$

Show your working clearly and give your answer as simply as possible.

$y = \dots\dots\dots$

