

FORMULAE (ADVANCED)

[ESTIMATED TIME: 70 minutes]

GCSE

(+ IGCSE) EXAM QUESTION PRACTICE

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 $3(y + 2x - 1) = x + 5y$

$y = \dots\dots\dots$

8.

[3 marks]

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

$\dots\dots\dots$



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.

..... cm²
(2)

- (b) The volume of water, V cm³, 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)

10.**[4 marks]**

$$I = kT^4$$

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

$$T = 5800$$

(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)

11.**[3 marks]**

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.

$y = \dots\dots\dots$