



EXAM PAPERS PRACTICE

Algebra

Question Paper



Question 1

Make x the subject of the formula.

$$y = \sqrt{x^2 + 1}$$

[3]

Question 2

$$y = p^2 + qr$$

(a) Find y when $p = -5$, $q = 3$ and $r = -7$.

[2]

(b) Write p in terms of q , r and y .

[2]



Question 3

Make b the subject of the formula.

[3]

$$c = \sqrt{a^2 + b^2}$$

Question 4

Simplify the expression.

[2]

$$(a^{\frac{1}{2}} - b^{\frac{1}{2}})(a^{\frac{1}{2}} + b^{\frac{1}{2}})$$



Question 5

Rearrange the formula $y = \frac{x+2}{x-4}$ to make x the subject. [4]

Question 6

Make w the subject of the formula. [4]

$$c = \frac{4 + w}{w + 3}$$



Question 7

$$w = \frac{1}{\sqrt{LC}}$$

- (a) Find w when $L = 8 \times 10^{-3}$ and $C = 2 \times 10^{-9}$.
Give your answer in standard form.

[3]

- (b) Rearrange the formula to make C the subject.

[3]



Question 8

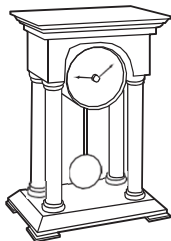
$$ap = px + c$$

Write p in terms of a , c and x .

[3]



Question 9



The length of time, T seconds, that the pendulum in the clock takes to swing is given by the formula

$$T = \frac{6}{\sqrt{(1+g^2)}}$$

Rearrange the formula to make g the subject.

[4]

Question 10

(a) $3^x = \frac{1}{3}$

Write down the value of x .

[1]

(b) $5^y = k$

Find 5^{y+1} , in terms of k .

[1]



Question 11

Make y the subject of the formula. $A = \frac{r(y+2)}{5}$ [3]

Question 12

Simplify $16 - 4(3x - 2)^2$. [3]



Question 13

Rearrange the formula to make y the subject.

$$x + \frac{\sqrt{y}}{9} = 1 \quad [3]$$

Question 14

(a) Factorise $ax^2 + bx^2$. [1]

(b) Make x the subject of the formula $ax^2 + bx^2 - d^2 = p^2$. [2]



Question 15

Two quantities c and d are connected by the formula $c = 2d + 30$.
Find c when $d = -100$.

[1]

Question 16



The number of tennis balls (T) in the diagram is given by the formula

$$T = \frac{1}{2} n(n+1),$$

where n is the number of rows.

The diagram above has 4 rows.

How many tennis balls will there be in a diagram with 20 rows?

[1]



Question 17

Make d the subject of the formula

$$c = \frac{d^3}{2} + 5. \quad [3]$$

Question 18

Make c the subject of the formula

$$\sqrt{3c - 5} = b. \quad [3]$$



Question 19

Make d the subject of the formula

$$c = kd^2 + e.$$

[3]



Question 20

Calculate the radius of a sphere with volume 1260 cm^3 .

[The volume, V , of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

[3]

Question 21

Rearrange the formula $c = \frac{4}{a-b}$ to make a the subject.

[3]



Question 22

Make x the subject of the formula.

$$y = \frac{x}{3} + 5$$

[2]

Question 23

Expand the brackets and simplify.

$$\frac{1}{2}(6x - 2) - 3(x - 1)$$

[2]



Question 24

Make x the subject of $y = \frac{(x+3)^2}{5}$. [3]

Question 25

Rearrange the formula $J = mv - mu$ to make m the subject. [2]



Question 26

$$\frac{g}{2} = \sqrt{\frac{h}{i}}$$

Find i in terms of g and h .

[3]

Question 27

Make d the subject of the formula $c = \frac{5d + 4w}{2w}$.

[3]



Question 28

Make x the subject of the formula.

$$P = \frac{x + 3}{x} \quad [4]$$

Question 29

Expand and simplify $2(x - 3)^2 - (2x - 3)^2$. [3]



Question 30

$$V = \frac{1}{3}Ah$$

(a) Find V when $A = 15$ and $h = 7$. [1]

(b) Make h the subject of the formula. [2]

Question 31

Rearrange the formula to make x the subject. [2]

$$y = x^2 + 4$$



Question 32

(a) Expand and simplify $(a + b)^2$. [2]

(b) Find the value of $a^2 + b^2$ when $a + b = 6$ and $ab = 7$. [1]

Question 33

A sphere has a volume of 80 cm^3 .

Calculate the radius of the sphere.

[The volume, V , of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.] [3]



Question 34

(a)

$$y = \sqrt{8 + \frac{4}{x}}$$

Find y when $x = 2$.

Give your answer correct to 4 decimal places.

[2]

(b) Rearrange $y = \sqrt{8 + \frac{4}{x}}$ to make x the subject.

[4]



Question 35

Expand the brackets.

$$y(3 - y^3)$$

[2]

Question 36

Make y the subject of the formula.

$$A = \pi x^2 - \pi y^2$$

[3]



Question 37

Find r when $(5)^{\frac{r}{3}} = 125$.

[2]

Question 38

Make w the subject of the formula.

$$t = 2 - \frac{3w}{a}$$

[3]



Question 39

$$T = 2\pi \sqrt{\frac{l}{g}}$$

(a) Find T when $g = 9.8$ and $l = 2$.

[2]

(b) Make g the subject of the formula.

[3]



Question 40

Find the value of $5a - 3b$ when $a = 7$ and $b = -2$.

[2]

Question 41

Make q the subject of the formula $p = 2q^2$.

[2]

Question 42

Make a the subject of the formula.

$$x = y + \sqrt{a}$$

[2]



Question 43

$$s = ut + 16t^2$$

[2]

Find the value of s when $u = 2$ and $t = 3$.

Question 44

$$y = \frac{qx}{p}$$

Write x in terms of p , q and y .

[2]



Question 45

Make p the subject of the formula.

$$rp + 5 = 3p + 8r$$

[3]

Question 46

Solve the equation.

$$6(y + 1) = 9$$

[2]



Question 47

Make x the subject of the formula.

$$y = ax^2 + b$$

[3]

Question 48

Simplify.

$$1 - 2u + u + 4$$

[2]



Question 49

Make r the subject of this formula.

$$v = \sqrt[3]{p+r}$$

[2]

Question 50

Make x the subject of the formula.

$$y = 2 + \sqrt{x-8}$$

[3]



Question 51

$$y = \frac{2}{x^2} + \frac{x^2}{2}$$

Find the value of y when $x = 6$.

Give your answer as a mixed number in its simplest form.

[2]

Question 52

Make x the subject of the formula.

$$y = (x - 4)^2 + 6$$

[3]