Name:

## Section A: Surds



2 Simplify: $\sqrt{3} \times \sqrt{3}$

3 Simplify: $\sqrt{12}$

4 Simplify: $\quad \sqrt{25}$


6 Simplify:
$\sqrt{147}$

Simplify: $\quad \sqrt{27}+\sqrt{108}$


10 Simplify: $\quad(3+\sqrt{7})^{2}$



C Ward
11 Simplify: $\quad(1-\sqrt{2})^{2}$

12 Simplify: $\quad(1+\sqrt{3})(1-\sqrt{3})$

13 Simplify: $\quad \frac{1}{\sqrt{2}}$

14 Simplify: $\frac{3}{\sqrt{3}}$

15 Simplify: $\frac{1}{1+\sqrt{2}}$


A $\frac{1}{2}$
B $\frac{\sqrt{2}}{2}$

| C | $\sqrt{2}$ | D | $\frac{2}{\sqrt{2}}$ |
| :---: | :--- | :--- | :--- |
|  |  |  |  |
|  |  |  |  |


A
B $\frac{1}{\sqrt{3}}$
C $\sqrt{3}$
D $\frac{3}{3 \sqrt{3}}$
Your answer to question 16:


Section B: Power Laws
Simplify the following by applying the laws of indices
$1 y^{3} \times y^{2}$

$2 y^{8} \div y^{4}$

$3 a^{7} \times a^{3}$

$4 r^{10} \div r^{2}$
$5 b^{3} \times b^{-4}$
$6 k^{5} \div k^{-4}$
$7 b^{-2} \times b^{-4}$
$83 b^{3} \times 2 b^{5}$
$96 r^{5} \div 3 r$
$10 \quad 12 g^{2} \div 4 g^{5}$
$11(2 x)^{2}$
$12 \frac{a^{2} b \times a b}{b^{2}}$
$13 \frac{2 c^{3} \times 6 b c}{8 b^{2} c^{2}}$
$14 \frac{a b^{3} \times a b c}{2 a^{2} b^{3}}$

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A
$b^{-1}$

b

A
$k^{9}$


A
$6 b^{15}$

$5 b^{8}$

D $5 b^{15}$ Your answer to question 8:
A
$2 r^{4} \quad \mathbf{B} \quad 2 r^{5}$

A
$3 g^{3}$

$\frac{3}{g^{3}}$

A
$4 x^{2}$
B
$2 x^{2}$


A
$\frac{c}{2}$
B
$\frac{b c^{2}}{2 a}$


C Ward
$15 \frac{4 c d^{2} \times d^{3}}{6 c d}$

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## Section C: Factorisation of a quadratic equation

Look at the quadratic equation below. One of the roots is 4 . What is the other?

$$
x^{2}-x-12=0
$$

2 Look at the quadratic equation below. One of the roots is 3. What is the other?

$$
x^{2}+5 x-24=0
$$

Look at the quadratic equation below. One of the roots is 4 . What is the other?

$$
x^{2}+36=13 x
$$

4
Look at the quadratic equation below. One of the roots is -1.5 . What is the other?

$$
2 x^{2}-x-6=0
$$

Look at the quadratic equation below. One of the roots is -0.5 . What is the other?

$$
2 x^{2}-7 x-4=0
$$

6
Look at the quadratic equation below. One of the roots is -3 . What is the other?

$$
3 x^{2}+5 x-12=0
$$

Look at the quadratic equation below. One of the roots is -6 . What is the other?

$$
x(x+5)=6
$$

Look at the quadratic equation below. One of the roots is 0.5 . What is the other?

$$
4 x^{2}-9 x=-3-x
$$ roots is -2 . What is the other?

$$
x(x-1)-2(x+5)=0
$$




Your answer to question 4:

$-2$


8


Your answer to question 5:


Your answer to question 6:



Look at the quadratic equation below. One of the roots is 2 . What is the other?

$$
2 x^{2}-x-6=0
$$

Look at the quadratic equation below. One of the roots is -2 . What is the other?

$$
x^{2}+6 x+8=0
$$

Look at the quadratic equation below. One of the roots is -2 . What is the other?

$$
x^{2}+10 x+16=0
$$

Look at the quadratic equation below. One of the roots is -3 . What is the other?

$$
x^{2}+12 x+27=0
$$

Look at the quadratic equation below. One of the roots is -3 . What is the other?

$$
x^{2}+8 x+15=0
$$

15 Look at the quadratic equation below. One of the roots is -5 . What is the other?

$$
x^{2}+7 x+10=0
$$

Look at the quadratic equation below. One of the roots is 6 . What is the other?

$$
x^{2}+3 x-18=0
$$

17 Look at the quadratic equation below. One of the roots is 5 . What is the other?

$$
x^{2}+3 x-10=0
$$


$\square$
A
$4 \quad \mathbf{B} \quad-4$
Your answer to question 11:



3


1


Your answer to question 14:


15


2

Your answer to question 15:



8


## Section D: Equations involving fractions

$1 \quad \frac{x+2}{3}=4$

$2 \quad \frac{x-3}{5}=1$

$3 \frac{3 x+5}{8}=x$
$4 \frac{2 x-16}{3}=2 x$
$5 \frac{2 x+6}{5}=3 x-4$
$6 \quad \frac{5 x-7}{2}=4$
$7 \quad \frac{7 x-1}{2}=13-x$

$8 \frac{2 x-5}{3}=25-x$


A

$10 \quad \frac{3 x-5}{6}=\frac{9-x}{9}$

$11 \frac{x+1}{6}=\frac{1-x}{4}$
0.2



C Ward
$13 \frac{x-1}{2}+\frac{x+1}{3}=\frac{2 x+5}{6}$
$14 \frac{2 x-4}{2}+\frac{x+1}{10}=\frac{2 x+1}{5}$
$15 \frac{2 x+1}{2}-\frac{x-1}{6}=\frac{x+8}{3}$
$1 \quad p=4 x$

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A
B
C
D

2

## Section E: Rearrangement of formulae

Make x the subject of the following formulae:

$$
2 \quad V=i x
$$


$3 \quad F=m x$
$\mathbf{A} F+m$
B $\frac{F}{m}$

A $A-2 \pi$
B $\frac{A}{2 \pi}$


A $\frac{A+2}{b}$
B
$\frac{2 A}{b}$

$8 \quad V=\frac{1}{3} A b x$
$9 p=q+x^{2}$

10 the $\frac{k}{x}$
$11 \quad v=u+a x$
$12 v^{2}=u^{2}+2 a x$
$13 s=2 \pi(r+x)$
$14 E=\frac{1}{2} m x^{2}$
$15 \quad A=\pi x^{2}$
$16 y=m x+c$
$17 V=\frac{4}{3} \pi x^{3}$

$\mathbf{A} \sqrt{p+q} \quad \mathbf{B} \sqrt{\sqrt{p-q}}$

| $\mathbf{C}$ | $\sqrt{p}-q$ | $\mathbf{D}$ |
| :---: | :---: | :---: |
| $\sqrt{p}+q$ |  |  |
|  |  |  |

A $\frac{t}{k}$


$\mathbf{A} \frac{v^{2}-u^{2}}{2 a}$
B $\frac{v-u}{2}$

| C | $2 a\left(v^{2}-u^{2}\right)$ | $\mathbf{D}$ |
| :--- | :--- | :--- |
|  | $\frac{v^{2}+u^{2}}{2 a}$ |  |
| on 12: |  |  |
|  |  |  |

A $\frac{s-2 \pi}{r}$
B $\frac{s}{2 \pi r}$

$\mathbf{A} \sqrt{\frac{2 E}{m}}$
B
$2 E m^{2}$
C $\sqrt{2 E m}$
D $\sqrt{\frac{E}{2 m}}$
Your answer to question 14:

A
$m(y+c)$
B
$\frac{y}{m}+c$

A $\sqrt[3]{\frac{3 V}{4 \pi}}$
B $\sqrt{\frac{4 V}{3 \pi}}$

| C | $(3 V \pi)^{3}$ |
| :--- | :--- |

D $\sqrt[3]{\frac{3 V \pi}{4}}$

| A | $\frac{P}{m r} \quad$ B $\sqrt{\frac{P r}{m}}$ |
| :--- | :--- | Your answer to question 18:

## Section F: Simultaneous equations

1 Look at the equations below. The solutions to $x$ and $y$ in that order are:

$$
x+y=5 \quad \text { and } \quad x-y=3
$$



2 Look at the equations below. The solutions to $x$ and $y$ in that order are:

$$
2 x+y=12 \quad \text { and } \quad 4 x-y=6
$$



7 and -2

3 Look at the equations below. The solutions to $x$ and $y$ in that order are:

## A

4 and 3


4 Look at the equations below. The solutions to $x$ and $y$ 4 in that order are:


$$
5 x+y=10 \quad \text { and } \quad 3 x-y=2
$$



1 and 5

$$
2 x+3 y=17 \quad \text { and } \quad 4 x-3 y=7
$$

5 Look at the equations below. The solutions to $x$ and $y$ in that order are:

$$
2 x+y=12 \quad \text { and } \quad x+y=7
$$

3 and 6

6 Look at the equations below. The solutions to $x$ and $y$ 6 in that order are:

$$
3 x-y=8 \quad \text { and } \quad 3 x-2 y=7
$$


$7 \begin{aligned} & \text { Look at the equations below. The solutions to } x \text { and } y \\ & \text { in that order are: }\end{aligned}$

$$
2 x+y=7 \quad \text { and } \quad x+y=5
$$



2 and 3

8 Look at the equations below. The solutions to $x$ and $y$ in that order are:

$$
x-7 y=5 \quad \text { and } \quad x-5 y=9
$$

 Look at the equations below. The solutions to $x$ and $y$
in that order are:

$$
x+y=8 \quad \text { and } \quad x-y=2
$$

 5 and 3


10 Look at the equations below. The solutions to $x$ and $y$ in that order are:

$$
3 x-y=11 \quad \text { and } \quad 3 x-2 y=13
$$

$\square$ B 3 and - 2


5 and 4 11 Look at the equations below. The solutions to $x$ and $y$ in that order are:

$$
x+2 y=7 \quad \text { and } \quad 3 x-4 y=21
$$



7 and 0

12 Look at the equations below. The solutions to $x$ and $y$ in that order are:

-3 and 2

$$
x+y=4 \quad \text { and } \quad 3 y-x=16
$$

13 Look at the equations below. The solutions to $x$ and $y$
13 in that order are:

A

$$
5 x+2 y=19 \quad \text { and } \quad 7 x-y=19
$$



1 and 0.5


2 and 0.25

$14 \begin{aligned} & \text { Look at the equations below. The solutions to } x \text { and } y \\ & \text { in that order are: }\end{aligned}$

$$
x+4 y=3 \quad \text { and } \quad 2 x-8 y=-2
$$

Your answer to question 14:

15 Look at the equations below. The solutions to $x$ and $y$ in that order are:


$$
3 x+y=7 \quad \text { and } \quad x+y=5
$$

2 and 1


1 and 4


4 and - 3

## Section $G$ : The equation of the line $y=m x+c$

1 What is the gradient of the line with equation given below:

$$
y=3 x+2
$$

What is the gradient of the line with equation given below:

$$
y=5 x+2
$$ What is the gradient of the line with equation given below:

$$
y=3 x-1
$$ below:

$$
y=\frac{x}{2}+3
$$




Your answer to question 1


2
 A

## $-1$



Your answer to question 3:
A $\square$
$\frac{1}{2}$


5
What is the gradient of the line with equation given below:
$\square$

$-\frac{1}{3}$

$$
y=-\frac{x}{3}+8
$$

6
What is the gradient of the line with equation given below:

$$
y=7-3 x
$$

What is the gradient of the line with equation given below:

$$
y=5 x+2
$$

8 What is the gradient of the line with equation given below:

$$
2 y=4 x+3
$$

What is the gradient of the line with equation given below:


10 What is the gradient of the line with equation given B below:

$$
y-3 x+1=0
$$

What is the gradient of the line with equation given below:

$$
2 y+8 x+5=0
$$

12 What is the gradient of the line with equation given below:

$$
3 x+y=4
$$

What is the gradient of the line with equation given below:

$$
\frac{x}{3}+\frac{y}{2}=1
$$



[^0]$\square$
$\square$ $-\frac{2}{3}$


3

14 What is the gradient of the line with equation given below:

$$
\frac{x}{4}-\frac{2 y}{3}=1
$$

A


Your answer to question 14:

15 What is the y axis intercept of the line in question 1? $\square$ $-3$



## Section H: Distance between two points

Find the distance between the two points given below:
$(1,8)$ and $(7,0)$


3 Find the distance between the two points given below: $(4,0)$ and $(-3,0)$

Find the distance between the two points given below:
$(1,5)$ and $(-2,1)$

$\sqrt{ } 5$

$\sqrt{ } 37$
 Find the distance between the two points given below:
$(-3,-4)$ and $(2,8)$


A


Your answer to question 1:


Your answer to question 3:

Your answer to question 4
 $\sqrt{ } 5$


$(1,1)$ and (2, -1 )
Your answer to question 7:

Find the distance between the two points given below:
$(3,3)$ and $(5,7)$

$\sqrt{ } 181$
 given below:
$(3,3)$ and $(5,-1)$



Your answer to question 10:


[^0]:    $\frac{1}{3}$

