# THE DUST ${ }^{\text {sandiod }}$ Knowledge Organiser Maths <br> Year 11 - Term 5 <br> Additional Maths 



Additional Online Homework:

| Platform | Due: |
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| 5 MathsWatch |
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## - Revision lessons just a oliokaway .

| Grade 1 |  |
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|  |  |
| Addition/Subtraction |  |
| $\begin{aligned} & ++ \text { becomes }+\quad \text { eg. } \\ & - \text { becomes }+ \\ & 5-(-3)=5+3 \end{aligned}$ |  |
| $\stackrel{\text { becomes - }}{ }+$ <br> - + becomes - <br> eg. $5+(-3)=5-3$ |  |
|  |  |
| Multiplication/Division |  |
| $\begin{aligned} & (+) \times(+) \text { becomes + eg. } \\ & (-) \times(-) \text { becomes }+\times(-5) \times(-3)=15 \end{aligned}$ |  |
| $(+) \times(-)$ becomes - |  |
| $(-) \times(+)$ becomes -4 eg. |  |

## Grade 2

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## Prime Numbers

$2,3,5,7,11,13,17,19,23,29, \ldots$
Each prime number has exactly two factors.
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Area of a triangle $=\frac{b \times h}{2}$Area of trapezium $=\frac{1}{2}(a+b) h \stackrel{\frac{b}{\frac{a}{\frac{a}{2}}} \sqrt{\frac{b}{a}}}{\square}$

## Revision lessons justa click away



## Grade 4

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The Laws of Indices Pythagoras

$$
x^{3} \times x^{0}=x^{3+b}
$$

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

$$
x^{n} \div x^{b}=x^{2-b}
$$

$$
\left(x^{a}\right)^{b}=x^{a b}
$$

$$
x^{-b}=\frac{1}{x^{3}}
$$

## Homework 1 - Non-calculato

1 Write 124 as a product of its prime factors.

$$
4
$$

(a) Write $1.63 \times 10^{-3}$ as an ordinary number.
(b) Write 438000 in standard form.

(b) Give a reason for your answer
$\qquad$
$\qquad$
$\qquad$

## 5 (a) Work out $1 \frac{3}{5}+2 \frac{1}{4}$

Give your answer as a mixed number.
(2)
(b) Show that $2 \frac{2}{3} \div 6=\frac{4}{9}$
(Total for Question 5 is 4 marks)
$6 \quad y=6 x-5$
Work out the value of $y$ when $x=-4$
There are 15 sweets in a jar.
4 of the sweets are red.
Jill takes at random a sweet from the jar.
(a) Write down the probability that the sweet is red

There are only green counters and blue counters in a bag.
A counter is taken at random from the bag.
The probability that the counter is green is 0.3
(b) Find the probability that the counter is blue.

8 (a) Simplify $\left(p^{2}\right)^{5}$
(b) Simplify $12 x^{7} y^{3} \div 6 x^{3} y$
(Total for Question 6 is 2 marks)

9 Here is a quadrilateral $A B C D$.


All the measurements are in centimetres.
The perimeter of $A B C D$ is 52 centimetres.
Work out the length of $D C$.

10 Increase 240 by $15 \%$

In Norway last year, the lowest temperature was $-15^{\circ} \mathrm{C}$
In Norway last year, the highest temperature was $42^{\circ} \mathrm{C}$ greater than the lowest temperature.
Work out the highest temperature in Norway last year.
(Total for Question 12 is 2 marks)
13
Here are the ages, in years, of 15 people.

| 19 | 28 | 29 | 33 | 27 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 27 | 37 | 25 | 27 | 37 |
| 17 | 45 | 47 | 25 | 26 |

Show this information in a stem and leaf diagram.

|  |  |
| :--- | :--- |
|  |  |
|  |  |
|  |  |

Key:
...............
(Total for Question 14 is 1 mark)
15 (a) Work out an estimate for the value of $92 \times 1.63$
You must show all your working.

Given that

$$
2.96 \times 3.2=9.472
$$

(b) find the value of $29.6 \times 32$

## (Total for Question 15 is 3 marks)

16
Simplify $3 \times w \times 5 \times t$
(Total for Question 16 is 1 mark)

17 There are only blue counters, green counters, red counters and yellow counters in a bag.
The table shows the number of blue counters in the bag.

| Colour | blue | green | red | yellow |
| :---: | :---: | :---: | :---: | :---: |
| Number of counters | 30 |  |  |  |

There is a total of 100 counters in the bag.
Ashin takes at random a counter from the bag.
(a) Find the probability that the counter is not blue.

The ratio of the number of blue counters to the number of green counters is $2: 3$
(b) Work out the number of green counters in the bag.

## Bradley says,

"The number of red counters in the bag is the same as the number of yellow counters in the bag."
(c) Can Bradley be correct?

Give a reason for your answer.
$\qquad$
$\qquad$

## Homework 2

1 Write the following numbers in order of size.
Start with the smallest number

| -11 | -2 | 8 | -7 | 3 | 10 |
| :--- | :--- | :--- | :--- | :--- | :--- |

..................................................................................
(Total for Question 1 is 1 mark)
2 Write $37 \%$ as a fraction.
(Total for Question 2 is 1 mark)
3 Write 0.4 as a percentage.
................................................ $\%$
(Total for Question 3 is 1 mark)
4 Safiya wants to hire a van.
She uses this rule to work out the cost of hiring a van for a number of days

$$
\text { Cost }=£ 45 \times \text { number of days }
$$

Safiya is going to hire the van for 7 days. Work out the cost.
£.....................................................
(Total for Question 4 is 2 marks)
5 Write 1476 to the nearest 10

6 Sophie works in a bed shop.
During the last three months she sold 198 beds.
59 beds were sold without a mattress.
45 beds were double beds.
17 of the single beds were sold without a mattress.
67 of the 83 king size beds were sold with a mattress.
Use this information to complete the two-way table.

|  | Single | Double | King size | Total |
| :---: | :---: | :---: | :---: | :---: |
| With mattress |  |  |  |  |
| Without mattress |  |  |  |  |
| Total |  |  |  |  |

(Total for Question 6 is $\mathbf{3}$ marks)
(b) Write the following fractions in order of size. Start with the smallest fraction.

$$
\begin{array}{llll}
\frac{3}{8} & \frac{9}{32} & \frac{1}{4} & \frac{21}{64}
\end{array}
$$

$\qquad$

8 The box below contains three mathematical symbols.


From the box, choose a symbol to make each of the following statements correct
(i) $\frac{5}{8} \ldots \ldots . . . . . . . . . . . . . . . . . . . . ~ \frac{2}{8}$


10
Here is part of a bus timetable between Wigan and Bolton.

| Wigan | 0720 |  | 0740 |  | 0755 |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Blackrod | 0749 |  | 0809 |  | 0824 |
| Horwich | 0800 | 0814 | 0820 | 0829 | 0836 |
| Lostock | 0809 | 0820 | 0829 | 0837 | 0844 |
| Park Road | 0814 | 0834 | 0841 | 0848 | 0858 |
| Bolton | 0832 | 0851 | 0858 | 0905 | 0915 |

(a) How many minutes should the 0720 bus take to go from Wigan to Lostock?
$\qquad$
Alison goes from Blackrod to Bolton by bus.
One day Alison leaves her house at 0800
She takes 7 minutes to walk to the bus stop in Blackrod.
She takes 15 minutes to walk from the bus stop in Bolton to work.
Alison needs to be at work for 0920
(b) Will Alison get to work for 0920 ?

You must show how you get your answer.
(a) Simplify $4 c+7 d+3 c-d$

- (2)
(b) Solve $5(2 m-6)=40$

There are $x$ sweets in a box.
There are $y$ sweets in a packet
(c) Write an expression, in terms of $x$ and $y$, for the total number of sweets in 3 boxes and 2 packets

12 Change 0.53 km to metres

14
Here is polygon $A B C D E F$ on a square grid.

(a) Write down the mathematical name of the polygon.
$\qquad$
(b) Which side of the polygon is parallel to the side $C D$ ?
(c) Write down a side of the polygon that is perpendicular to the side $A F$.
(1)
(Total for Question 14 is 3 marks)
15 Here are the first five terms of an arithmetic sequence.

| 7 | 13 | 19 | 25 | 31 |
| :--- | :--- | :--- | :--- | :--- |

(a) Find an expression, in terms of $n$, for the $n$th term of this sequence.

16 (a) Expand and simplify $4(x+3)+7(4-2 x)$
(b) Factorise fully $15 x^{3}+3 x^{2} y$

17 Ella invests $£ 7000$ for 2 years in an account paying compound interest. The interest rate is $3 \%$.
(a) How much money is in the account after 3 years?
$\qquad$
(b) How many years will it take until there is more than $£ 9,000$ in the account?
$\qquad$

## Homework 3

1
Write $35 \%$ as a fraction.

2 Write down two factors of 12
(Total for Question 1 is 1 mark)
2
...................................... ........................................
(Total for Question 2 is $\mathbf{1}$ mark)

3
Write $\frac{4}{5}$ as a decimal.

Total for Question 3 is 1 mark )

Four students play a game.
The table shows the number of points each student has.

| Student | Ali | Barbara | Calliope | Danesh |
| :--- | :---: | :---: | :---: | :---: |
| Number of points | 143 | 121 | 45 | 19 |

Barbara has more points than Danesh.
(a) How many more?
$\qquad$
(b) Work out the mean number of points.

5 Write the following numbers in order of size. Start with the smallest number.
0.41
0.5
0.46
0.408
$\frac{1}{4}$ of these bars of chocolate were large bars.
The rest of the bars of chocolate were small bars.
All the large bars of chocolate were sold for $£ 1$ each.
All the small bars of chocolate were sold for 60 p each.
Work out the total amount of money for which the 208 bars of chocolate were sold. Give your answer in pounds.

208 bars of chocolate were sold from a shop.
(Total for Question 5 is 1 mark)
£...
(Total for Question 6 is $\mathbf{3}$ marks)

7 Write 60 metres as a fraction of 1 km .
Give your answer in its simplest form

## 8 Here is a cuboid.

(Total for Question 7 is 2 marks )


Work out the volume of the cuboid

9 There are 400 counters in a box.
The counters are red or yellow or green.
$\frac{3}{8}$ of the counters are red.
82 of the counters are yellow.
82 of the counters are yellow.
What percentage of the counters are green?
-

10

(a) Write down the coordinates of point $A$.
$\qquad$
(b) On the grid, mark with a cross $(\times)$ the point $(1,4)$ Label this point $B$.
(c) On the grid, draw the line with equation $y=-3$
(Total for Question 10 is $\mathbf{3}$ marks)
(a) Write 2530 correct to 2 significant figures.
(b) Write 0.0874 correct to 1 significant figure.

(a) Change 850 grams to ounces.
$\qquad$ (1)
(b) Change 80 ounces to grams.
grams
(2)
$\qquad$

13
(a) Expand $3(4-2 x)$
(b) Solve $\frac{3 y}{4}=12$

(c) Factorise $4 p+6$
$\qquad$

## (Total for Question 13 is 4 marks)

14 Work out the lowest common multiple (LCM) of 24 and 56

Total for Question 14 is 2 marks)
(Total for Question 12 is 3 marks)

15

$$
\mathbf{a}=\binom{2}{3} \quad \mathbf{b}=\binom{-1}{2} \quad \mathbf{c}=\binom{4}{1}
$$

(a) Work out as a column vector
(i) $\mathbf{a}+\mathbf{b}$
(1)
(ii) $2 \mathbf{a}-\mathbf{c}$
$16 \quad T=4 m^{2}-11$
(a) Work out the value of $T$ when $m=-3$
$T=$
(2)
(b) Make $p$ the subject of the formula $d=3 p+4$
$\qquad$



