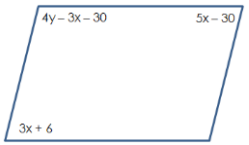
Maths Non-Calculator

Work out $2\frac{3}{4} \times 1\frac{2}{5}$

A circle has equation $x^2 + y^2 = 20$. Find the equation of a tangent to the circle where $x = 2$ and $y > 0$.



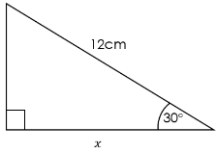
The shape above is a parallelogram. Find the value of y.

(a) Write 360 as a product of prime factors.
(b) Write 420 as a product of prime factors.
(c) Use your answers to (a) and (b) to find the Highest Common Factor (HCF) of 360 and 420.
(d) Use your answers to (a) and (b) to find the Lowest Common Multiple (LCM) of 360 and 420.

6th

A wall is 8m long and 1.8m high. Paul is tiling it with tiles which measure 20cm by 18cm. The tiles are to be red, white and black. $^5/_8$ are to be red. White and black are to be in the ratio 7:8.
How many of each colour will he require?

7th



Find the value of x.
Give your answer in exact form.

8th

Put these numbers in order of size, from smallest to largest…
0.031, 2.98 x 10^{-2}, 0.4 x 10^{-1}, 937 x 10^{-5}

9th

On her way to work, Jill has to go through two sets of traffic lights. The probability she is stopped by the 1st set is 0.3. The probability she is stopped by the 2nd set is 0.4. On a particular day, what is the probability she is stopped by exactly 1 set of lights?

10th

A cube is made of concrete. It has length of side 40cm.
The density of concrete is 2.5g/cm^3.
What is the mass of the cube? Give your answer in kilograms.

11th

(a) Complete the table of values for the function $y = x^2 - 2x - 8$.

x	-4	-3	-2	-1	0	1	2	3	4	5
y										

(b) On axes similar to the ones on the left, plot the graph of $y = x^2 - 2x - 8$.
(c) Use your graph to solve the equation $x^2 - 2x - 8 = 0$
(d) Write down the coordinate of the turning point of $y = x^2 - 2x - 8$.

12th

13th

(a) Solve the equation $x^2 + 2x - 80 = 0$
(b) Solve the inequality $3 - 5x \leq 9 - 2x$

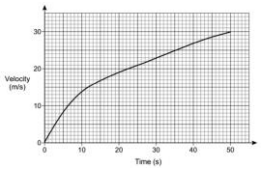
14th

Show that $\frac{5-4\sqrt{3}}{9+2\sqrt{12}}$

Can be written as

$\frac{93-56\sqrt{3}}{33}$

15th

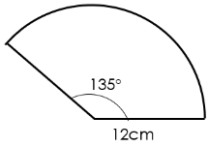


Estimate the acceleration after 10 seconds.

16th

A line is perpendicular to another line with equation 5x + 2y – 7 = 0.
It goes through the point with coordinate (3, -2).
Work out the equation of the line in the form ax + by + c = 0 where a, b and c are integers to be found.

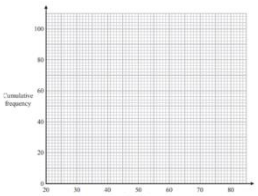
17th



Find the sector area AND arc length of this sector. Give your answer in terms of π.

18th

Time, t (mins)	Frequency
$20 < t \leq 30$	9
$30 < t \leq 40$	16
$40 < t \leq 50$	20
$50 < t \leq 60$	29
$60 < t \leq 70$	15
$70 < t \leq 80$	11



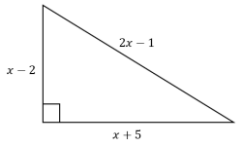
19th

(a) On axes similar to those on the right, draw a cumulative frequency diagram for the data in the table, the time taken for some people to travel to an event.
Estimate the
(b) inter-quartile range.
(c) number of people who took longer than 65 minutes.

20th

Given that $\frac{a}{b} = \frac{4}{9}$ & $\frac{a}{c} = \frac{5}{12}$
Find a : b : c giving your answer in its simplest form

21st



Find the perimeter of this right-angled triangle.

22nd

An equilateral triangle has side of 6cm.
Find the area of the triangle, giving your answer as an exact number.

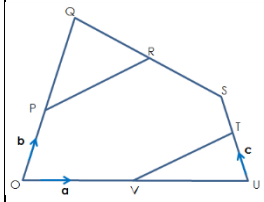
23rd

M is indirectly proportional to the cube root of P.
When M = 10, P = 8.
What is the value of P when M = 40?

24th

Work out $4\frac{2}{3} - 2\frac{5}{8}$

25th



26th

P, R, T and V are the midpoints of OQ, QS, SU and OU respectively.
$\overrightarrow{OV} = \boldsymbol{a}, \overrightarrow{OP} = \boldsymbol{b}$ & $\overrightarrow{UT} = \boldsymbol{c}$

Show that PR and VT are parallel.

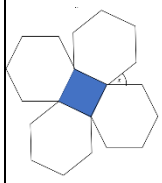
27th

The ratio of men to women in a company is 9:11.
Of the men, 10% are left handed.
95% of the women are right handed.
What percentage of the company are left handed?

28th

Write $1.1\dot{3}\dot{5}$ as an improper fraction in its simplest form.

29th


The diagram shows a square surrounded by regular hexagons.
Find the size of angle x.

30th

Work out the answer to,,,
(a) $(5.2 \times 10^{-4}) \times (4 \times 10^{-3})$
(b) $\frac{1.2 \times 10^2}{4.8 \times 10^{-5}}$

31st

Find the value of
(a) 12^0
(b) $125^{4/3}$
(c) $\left(\frac{8}{27}\right)^{-5/3}$

The best way to learn mathematics is to DO mathematics.
If you do something regularly on a daily basis you will make a bigger difference than leaving it till just before your exams.
If you need help there are some fantastic videos at www.corbettmaths.com
Or you can always tweet me **@mrchadburn**