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Questions

Maths Paper 3 - Higher

Simplify

$(3x^2)^3$

The gradient of a radius of a circle is -3.
The tangent to the circle passes through the point (6,2). Work out the equation of the tangent

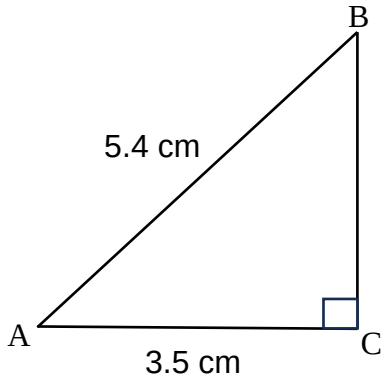
Solve

$3x^2 + 4x - 10 = 0$

$x = 3.2$ when rounded to 1 decimal place
$y = 1.42$ when rounded to 2 decimal places

(a) Work out the LB of xy
(b) Work out the UB of $\frac{x}{y}$

Work out the length of BC



Leo travels 240 miles in 4.5 hours.
Work out his average speed.

Simplify

$\left(\frac{9}{4}\right)^{-\frac{3}{2}}$

Express 60 as a product of prime factors

The density of an object is 4g/cm^3
The mass is 50g.
Work out the volume.

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The price of a shirt has decreased by 30%. It now costs £84.
Work out the original cost

Prove that the sum of three consecutive numbers is a multiple of 3.

Solve

$$3x + y = 10$$
$$4x - 2y = 10$$

Work out the two points that $y = x^2 + 4x + 3$ crosses the x-axis

y is directly proportional to x.
When $y = 15$ and $x = 30$
Work out the value of y when $x = 5$

Estimate the mean

Time (t)	Frequency		
$0 \leq t < 1$	5		
$1 \leq t < 2$	8		
$2 \leq t < 3$	1		

y is inversely proportional to x.
When $y = 15$ and $x = 30$
Work out the value of y when $x = 5$

Express 250 as a product of primes

Work out the nth term of
2,8,18,32 …

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Examples/ Key words

Maths Paper 3 - Higher

Convert 3200 into standard form
$3200 = 3.2 \times 10^3$

Work out $4.2 \times 10^4 + 8 \times 10^3$.
Give your answer in standard form

$42{,}000 + 8000 = 50{,}000$
$50{,}000 = 5 \times 10^4$

Volume of a cube = base x height x depth or length^3

Surface area of a cuboid = The sum of the area of the 3 pairs of congruent rectangles

Gradient of a curve = draw tangent of the curve and find the gradient

$$\frac{difference\ in\ y}{difference\ in\ x}$$

The 5 values required for a boxplot are:

- Lowest value
- Lower quartile
- Median
- Upper quartile
- Highest Value

The volume of a shape is 20cm^3.
The mass of the shape is 120g.
Find the density.
Density = g:cm^3

120:20

6:1

Density = 6g/cm^3

When drawing a cumulative frequency graph, use the end point of the range

Estimate = make the question easier by rounding

Evaluate = work out the answer

Express = Write in the different way

Simplify = Change the appearance

Angles in regular polygons:
Sum of the interior angles = $(n-2) \times 180$
To find an interior angle = $\frac{total}{n}$ n= number of angles/sides.

Sum of the exterior angles = 360°
To find an exterior angle = $\frac{360}{n}$ n= number of angles/sides

Circle Theorem Tips:

- Radius and tangent = 90°
- Radius and chord = alternate segment theorem
- 2 radii = an isosceles triangle