

OCR GCSE Mathematics Calculator 2021 Higher Paper 3 Revision Worksheet

Question 8

- (a) Train A travels 120 km at a constant speed of 80 km/h. Train B travels 120 km at a constant speed of 50 km/h. How **many more minutes** does train B take to travel 120 km than train A?
- (b) Train C has a speed of x km/h. Write an algebraic expression for train C's speed in metres per second.

Question 9

The width, w , of a kitchen cupboard is 60 cm, correct to the nearest centimetre.

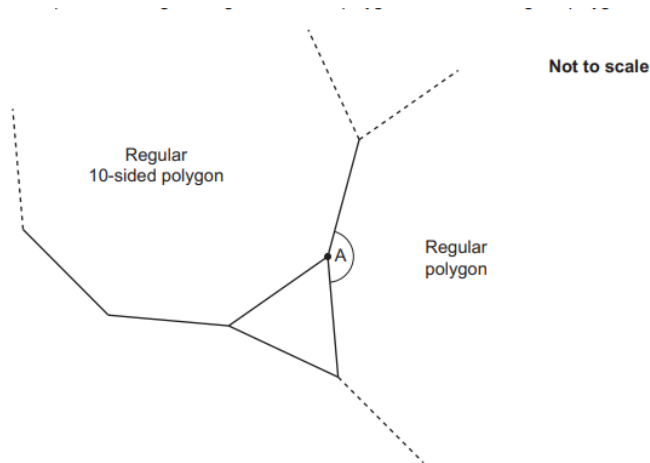
- (a) Complete the error interval for the width, w .

(a) $< w \leq$ [2]

(b) Six of these kitchen cupboards are to be placed side by side along a kitchen wall. The wall is 363 cm long, correct to the nearest centimetre.

- (i) Show that the six cupboards may not fit along the wall. [3]
- (ii) Find the upper bound of the space remaining if six cupboards do fit along the wall.

Question 10



An equilateral triangle, a regular 10-sided polygon and another regular polygon meet at a point.

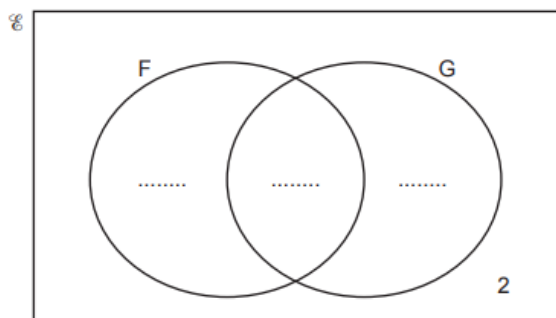
- (a) Show that angle A is 156° . [3]
- (b) Work out the number of sides of the other regular polygon.
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Question 11

In a class of 30 students:

- 17 study French (F)
- 20 study German (G)
- 2 do not study either subject.

(a) Complete the Venn diagram.



(b) Two of the 30 students are chosen at random.

Calculate the probability that one of these two students studies French but not German and the other studies German but not French. You must show your working.

Question 12

A solid metal sphere has mass 235 g. The density of the metal is 7.78 g/cm^3 .

Show that the surface area of this sphere is 46.9 cm^2 , correct to 3 significant figures.

You must show your working. [For a sphere with radius r : Volume $= \frac{4}{3}\pi r^3$; Surface area $= 4\pi r^2$.]

Question 13

A straight line passes through the point (8, 1) and is perpendicular to the line $y = 4x - 2$

Find the equation of the line, giving your answer in the form $y = mx + c$.

Question 14

y is inversely proportional to the square root of x . $y = 5$ when $x = 36$.

(a) Find a formula linking x and y .

(b) Find the value of x when $y = 20$.

Question 15

(a) Show that the equation $x^3 - 5x - 1 = 0$ has a solution between $x = 2$ and $x = 3$.

(b) Find this solution correct to 1 decimal place. You must show your working.

Question 16

The following kinematics formulas may be used in this question.

$$v = u + at$$

$$s = ut + \frac{1}{2}at^2$$

$$v^2 = u^2 + 2as$$

The initial velocity of a particle is 20 m/s.

The acceleration of the particle is -8 m/s^2 .

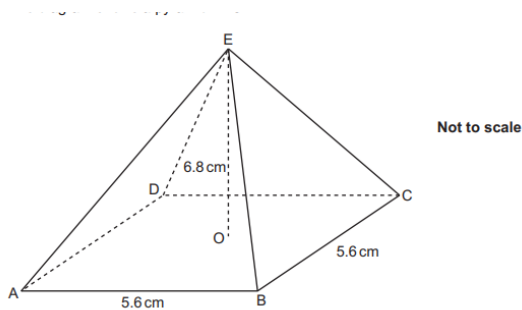
After t seconds, the particle has travelled 25 m.

(a) Show that $4t^2 - 20t + 25 = 0$.

(b) Solve $4t^2 - 20t + 25 = 0$.

(c) Show that the particle is stationary when it has travelled 25 m.

Question 17



The diagram shows a pyramid $ABCDE$.

- The pyramid has a square horizontal base $ABCD$ with side 5.6 cm .
- The vertex E is vertically above the centre O of the base.
- The height OE of the pyramid is 6.8 cm .

Calculate the surface area of the pyramid. You must show your working.

Question 18

Rearrange this formula to make y the subject.

$$\frac{5y+2}{y} = \frac{3t-7}{2}$$