



Main Courses

3 mark questions



1. Levi sells bags of crisps. He sells a bag of crisps for £1.68. He makes a profit of 12% on the cost price of a bag of crisps. He buys the bags of crisps in boxes. Each box contains 10 bags of crisps. Calculate the cost price of a box of crisps.

2. An engineering company makes metal parts for engines. The diagram below shows the design for a split-disc. The split-disc is drawn as two concentric circles, each with centre O . Both OAB and ODC are straight lines.

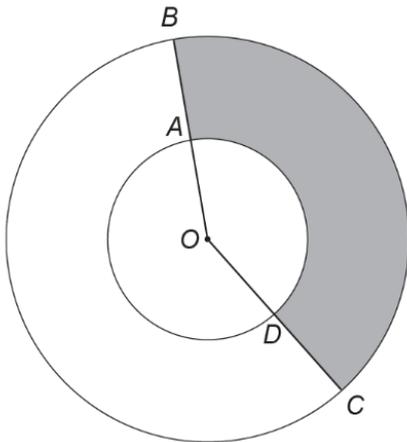


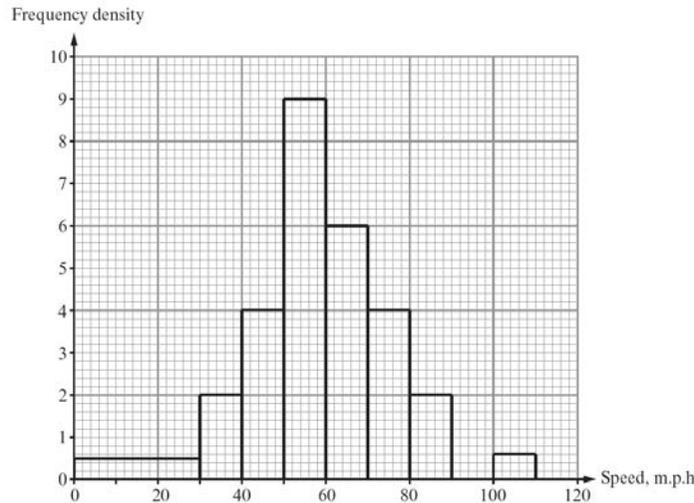
Diagram not drawn to scale

It is known that $\widehat{AOD} = 142^\circ$ and $OA = AB = 1.8$ cm. The company needs to know the area of the shaded surface $BCDA$. Calculate this area.



3. The reciprocal of the speed of light squared is 2.22×10^{-18} . Find the speed of light in standard form correct to two significant figures.

4. The histogram below shows the speeds of motorists as they enter a tunnel between 1 a.m. and 2 a.m.



The speed limit on entering the tunnel is 70 m.p.h. How many motorists were exceeding the speed limit on entering the tunnel?

5. Express 936 as a product of prime numbers in index form.

6. Given that $f = \sqrt{2}$, $g = \sqrt{5}$ and $h = \sqrt{10}$, find, in its simplest form,

(a) $\frac{fg}{h}$, (b) $fg + h$, (c) fh .

7. Given that y is inversely proportional to x , and that $y = 50$ when $x = 2$, find an expression for y in terms of x .

8. The diagram shows a right-angled triangle.

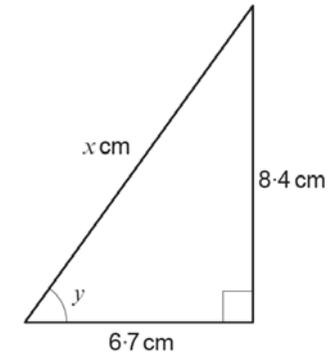


Diagram not drawn to scale

(a) Calculate the value of x .

(b) Calculate the size of angle y .

9. Boris bought a car in Moscow for 251,850 Russian roubles.

(i) Each year, the value of Boris's car depreciates by 10% of its value at the start of the year. At the end of two years, by how much has the value of Boris's car depreciated?

(ii) The exchange rate for Russian roubles when Boris bought his car was £1 = 50.37 Russian roubles. At the same time, Angharad bought a car in Wales. Angharad paid £5250 for her car. How much more than Boris did Angharad spend on buying her car? Give your answer in pounds.

10. Manilo won some money. He gave each of his close friends $\frac{1}{24}$ of the money he won. He kept the remaining $\frac{2}{3}$ of the money for himself. How many close friends does Manilo have?



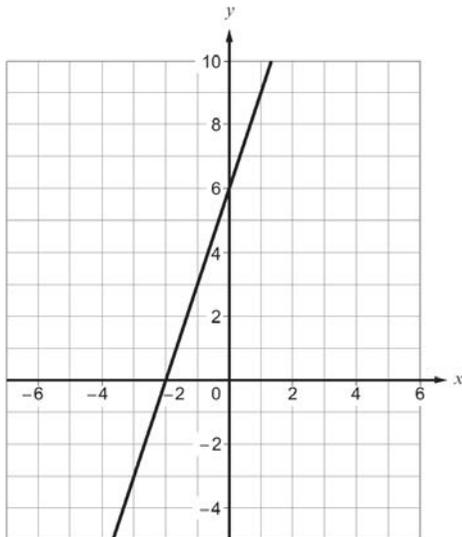


Puddings

2 mark questions



- Write 0.864 as a fraction.
- Estimate the value of $\frac{43.3 \times 49.8}{200}$.
- Write down the value of one half of $3\frac{1}{2}$.
- Express $\frac{12}{99}$ as a recurring decimal.
- Find the equation of the straight line shown in the following diagram. Write your answer in the form $y = mx + c$.



- Find the greatest common divisor of 105 and 180.
- Given that $f = -3$, $g = 2$ and $h = 5$, find the value of $\frac{f^2 - h}{g}$.
- Expand $2x(x + 6)$.



Drink

Assorted questions



- Calculate $\frac{2}{5} + \frac{3}{4}$.
- Simplify $5p - 3q - 8p - 7q$.
- Draw a circle. Add a chord, a tangent and a sector to the circle.
- Calculate the circumference and area of a circle with radius 8.3cm.
- Change $4m^2$ to be in cm^2 .
- A number of tables are for sale in an antiques shop.



Price, £x	Number of tables
$50 \leq x < 100$	6
$100 \leq x < 150$	10
$150 \leq x < 200$	4

Find an estimate for the mean value of the price of a table in this antiques shop.

- Express $100^{-\frac{1}{2}}$ as a fraction.
- Calculate 75% of £562.80.
- Evaluate $3\frac{2}{5} \times 1\frac{2}{3}$.
- Deiniol travels 3km to the North, then 4km to the West. How far is Deiniol from his starting position?
- How many vertices, edges and faces does a tetrahedron have?
- What is the perimeter of a rectangle which measures 4cm by 7cm?
- Here are Class 9C's favourite colours:
Red 8 Blue 6 Yellow 3 Pink 5 Purple 2.
Draw a pie chart to illustrate 9C's favourite colours.

Mathematical Menu

Higher Tier



Starters

1 mark questions



- Write 652000 in standard form.
- The breadth of an oven was measured as 65cm, correct to the nearest cm. What is the smallest possible breadth of the oven?
- What is 9^0 ?
- Round off 0.002758 to 2 significant figures.
- What comes next? 2, 5, 10, 17, 26,
- Solve the equation $3x = 12$.
- What type of angle is the angle 165° ?
- Calculate the mode of 5, 2, 9, 2, 5, 6.
- Give an example of an irrational number whose square is rational.
- Describe, in words, the rule for continuing the number sequence 48, 12, $3\frac{3}{4}$, ...
- Calculate 534×8 .
- What is the sum of the interior angles of any triangle?
- Simplify $3p^6 \times 5p^5$.
- The product of two numbers is 77. Their sum is 18. What are the two numbers?