

OCR GCSE Mathematics Calculator 2023 Higher Paper 1 Revision Worksheet

Questions 1–10

1. Calculate.

$$\sqrt{5.2^2 - 4.8 \times -6.3}$$

Give your answer correct to 3 significant figures.

2. The price of petrol decreases from £1.32 per litre to £1.02 per litre.
Calculate the percentage decrease in the price.

3. (a) Eve, Jack and Ling share some money in the ratio 2 : 3 : 4. Jack gets £720. Work out how much Ling gets.

(b) Amir, Beth and Casey share some money in the ratio 3 : 5 : c. Casey's share is $\frac{3}{2}$ of the total. Find the value of c.

4. Alex invests £4500 at a rate of 7.5% per year simple interest.

(a) Find the value of the investment at the end of 4 years.

(b) At the end of t years, the value of the investment is over £13,500 for the first time. Find the value of t.

5.

(a) Write 0.00386 in standard form.

(b) The speed of sound is 3.43×10^{-1} m/s. An object is travelling at the speed of sound. **Work out how far the object travels in one day. Give your answer in km.**

(c) In a science fiction story, a spacecraft travelling faster than the speed of light is said to be travelling at 'warp n' where n is an integer. Warp n is defined as $n \times$ the speed of light. In the story, a spacecraft needs to travel from Earth to Neptune in less than 2 minutes.

- The speed of light is 3.00×10^8 m/s.
- The distance from Earth to Neptune is 4.41×10^9 m.

Find the smallest possible warp n at which the spacecraft can travel. You must show your working.

6.

A six-sided numbered spinner is thrown 50 times. The score for each throw is recorded. Some of the results are shown in the table below.

An 8 was thrown f times.

An unknown number on the spinner is represented by n . The mean score of the 50 throws is 5.

Score	Frequency
1	12
3	2
5	9
6	16
8	f
n	4
Total	50

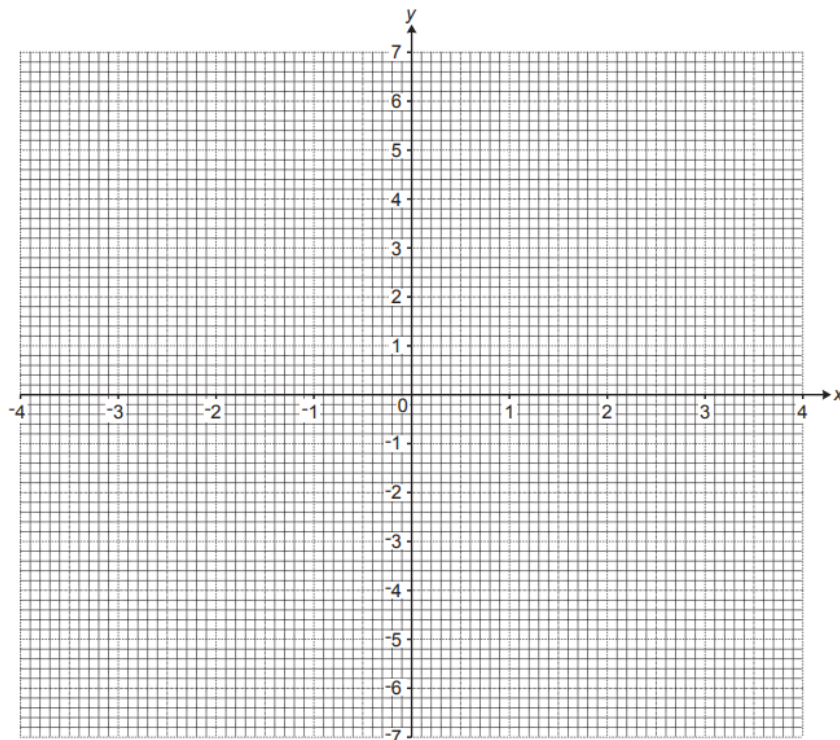
Find the value of f and the value of n .

7.

Here is a table of values for $y = \frac{6}{x} - 2x$.

x	-4	-3	-2	-1	1	2	3	4
y	6.5	4	1	-4	4	-1	-4	-6.5

(a) Draw the graph of $y = \frac{6}{x} - 2x$ for $-4 \leq x \leq 4$, $x \neq 0$.



[3]

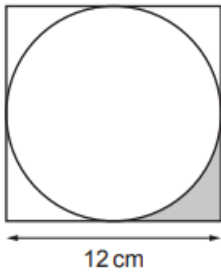
(b) Use your graph to find the positive solution of $\frac{6}{x} - 2x = 0$.

Give your answer to 1 decimal place.

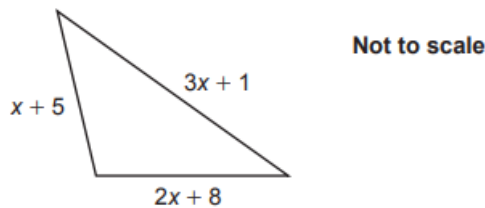
(a) Draw the graph of $y = \frac{6}{x} - 2x$ for $-4 \leq x \leq 4, x \neq 0$.

(b) Use your graph to find the positive solution of $\frac{6}{x} - 2x = 0$. Give your answer to 1 decimal place.

8. The diagram shows a circle inside a square of side 12 cm. Work out the percentage of the square that is shaded. You must show your working.



9. The sides of this triangle are given in centimetres. The perimeter of the triangle is 80 cm.



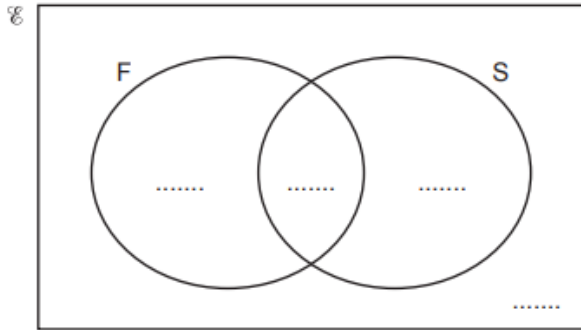
(a) Find the length of each side of the triangle.
You must show your working.

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(b) Is the triangle above a right-angled triangle? Use calculations to show how you decide.

10. 100 people were asked whether they had visited France (F) or Spain (S).

- 55 had visited France
- 60 had visited Spain
- 4 had not visited either country



(a) Complete the Venn diagram.

(b) One of these 100 people is chosen at random.

(i) Write down the probability that this person had visited exactly one of the countries.

(ii) Write down the probability that this person had visited France given that they had also visited Spain.