

On The Trial Trail

~ Revision Papers ~

For the January 2024 IGCSE Trial Examinations

Target Grades : Level 4, 5, 6 and 7



“Brain illumination”

A photograph by Martin Hansen
The night sky over Shrewsbury, England,
on 25th November 2023 at 7.22 pm

Trial Trail Revision #1

IGCSE Mathematics
Trial Trail Revision Papers

Answer as many questions as you can
You are expected to have a calculator available

Marks Available : 40

Question 1

Leon worked out the area of a rectangle in cm^2 .
The answer appeared on his calculator as follows;

202500

- (i) Write this number in standard form.

[1 mark]

- (ii) The length of the rectangle was 250 cm.
What was its width ?

[3 marks]

Question 2

Square each of the following;

- (i) 13

- (ii) $\sqrt{45}$

- (iii) $(2x + 3)$

- (iv) $\sin 30^\circ$

[1, 1, 3, 2 marks]

Question 3

Toby has $\text{£}x$ in his wallet.
Ashton has $\text{£}14$ more than Toby in his wallet.
Altogether they have $\text{£}60$ in the two wallets.
What is the value of the money in Toby's wallet ?

[3 marks]

Question 4

A Nestlé 6 pack selection of breakfast cereals contains the following;

- 45g box of “Shreddies”
- 50g box of “Fruitful”
- 30g box of “Golden Grahams”
- 25g box of “Cheerios”
- 30g box of “Nesquik”
- 40g box of “Clusters”

Clearly showing your working, calculate the mean (average) of the weights of the boxes of breakfast cereal.

[4 marks]

Question 5

When driving in his car, Dr Linear Knott averaged 40 km/h for 2 hours and then averaged 60 km/h for 3 hours.

Dr Linear Knott mistakenly thinks that his average speed is 50 km/h.

You must explain in three steps why he is wrong.

(i) What distance did he cover in the first 2 hours ?

[2 marks]

(ii) What distance did he cover in the second 3 hours ?

[2 marks]

(iii) Calculate his overall average speed in km/h by using the formula,

$$\text{Average Speed} = \frac{\text{Total distance}}{\text{Total time}}$$

[2 marks]

Question 6

A bag contains some shapes.

Each shape is a circle or a triangle or a square.

Lewis takes at random a shape from the bag.

The probability that he will take a circle is 0.3

The probability that he will take a triangle is 0.1

(i) Work out the probability that he will take a square.

[2 marks]

(ii) Work out the probability that he will take a shape with straight edges.

[2 marks]

Frankie takes at random one of the shapes from the bag and then replaces the shape.

She does this 160 times.

(iii) Work out an estimate for the number of times she will take the circle.

[2 marks]

Question 7

Ryan's salary was increased from £56 500 to £59 664

(i) Work out the percentage increase in Ryan's salary.

[2 marks]

Monty's salary was increased by 5.2%

After the increase, his salary was £56 282

(ii) Work out his salary before the increase.

[2 marks]

Question 8

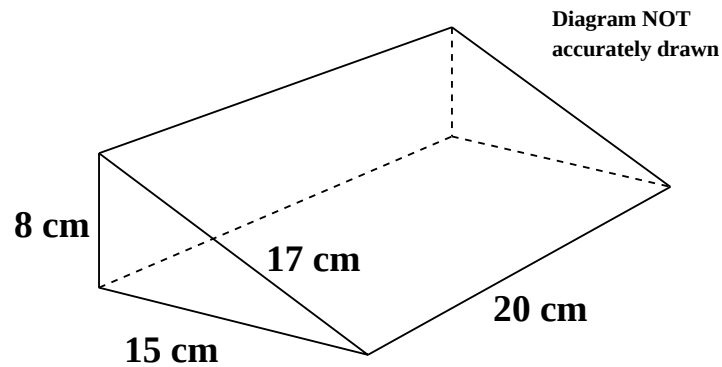
The diagram shows a prism.

The cross section of the prism is a right-angled triangle.

The lengths of the sides of the triangle are 8 cm, 15 cm and 17 cm.

The length of the prism is 20 cm.

Work out the total **surface area** of the prism.



Be sure to show detailed working such that a marker can follow your method.

[6 marks]

ANSWERS

Trial Trail Revision #1

IGCSE Mathematics
Trial Trail Revision Papers

Answer 1

(i) 2.025×10^5

[1 mark]

(ii) $A = L \times W \Leftrightarrow W = \frac{A}{L}$

$$W = \frac{202500}{250} = 810 \text{ cm}$$

[3 marks]

Answer 2

(i) 169

(ii) 45

(iii) $4x^2 + 12x + 9$

(iv) 0.25

[1, 1, 3, 2 marks]

Answer 3

$$x + x + 14 = 60$$

$$2x + 14 = 60$$

$$2x = 46$$

$$x = 23 \quad \text{Toby has £23 in his wallet}$$

[3 marks]

Answer 4

Key line of working: $mean = \frac{45 + 50 + 30 + 25 + 30 + 40}{6}$
 $= \frac{220}{6} = 36 \frac{2}{3} \text{ or } 36.\dot{6} \text{ g}$

[4 marks]

Answer 5

(i) 80 km

(ii) 180 km

(iii) 52 km/h

[2, 2, 2 marks]

Answer 6

(i) 0.6

(ii) 0.7

(iii) 48 times

[2, 2, 2 marks]

Answer 7

$$\begin{aligned} \text{(i)} \quad \text{Percentage Increase} &= \frac{\text{Increase in Salary}}{\text{Original Salary}} \times 100 \\ &= \frac{59664 - 56500}{56500} \times 100 \\ &= 5.6 \% \end{aligned}$$

[2 marks]**(ii)** The clever method...

To increase something by 5.2 % multiply it by 1.052

$$x \times 1.052 = 56282$$

$$x = \frac{56282}{1.052}$$

$$= 53500 \quad \text{So, Monty's salary used to be £53 500}$$

[2 marks]**Answer 8**

$$\begin{aligned} &2 \times \left(\frac{1}{2} \times 15 \times 8 \right) + 15 \times 20 + 17 \times 20 + 8 \times 20 \\ &= 120 + 300 + 340 + 160 \\ &= 920 \text{ cm}^2 \end{aligned}$$

[6 marks]

Trial Trail Revision #2

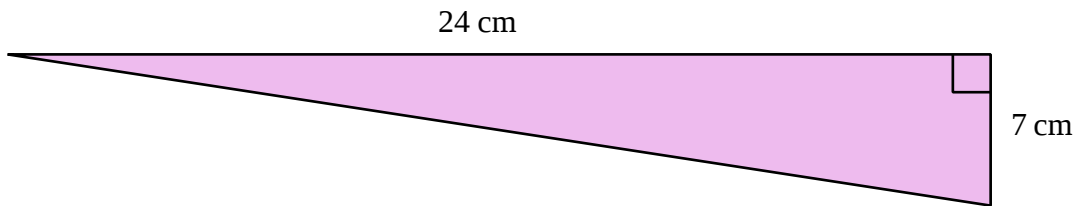
IGCSE Mathematics
Trial Trail Revision Papers

Answer as many questions as you can
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Marks Available : 40

Question 1

A right angled triangle has a base of 24 cm, and a height of 7 cm, as shown.



- (i) Work out the area of the triangle.
Be sure to state the units of your answer.

[2 marks]

- (ii) Use the Theorem of Pythagoras to calculate the length of the hypotenuse
of the triangle.

[2 marks]

- (iii) State the perimeter of the triangle.

[1 mark]

Question 2

Expand the brackets and simplify;

- (i) $(x - 2)(x - 7)$

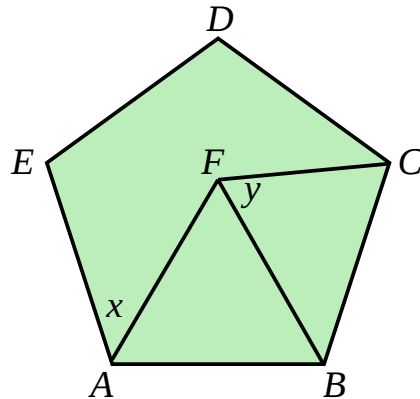
[2 marks]

- (ii) $(4x + 3)(x + 5)$

[2 marks]

Question 3

The diagram shows an equilateral triangle ABF and a regular pentagon $ABCDE$



- (i) What is the size of the angle marked x ?

[2 marks]

- (ii) What is the size of the angle marked y ?

[2 marks]

Question 4

Solve, $5(x - 4) = 35$

[2 marks]

Question 5

- (i) Write down the value of π^0

[1 mark]

- (ii) Given that $3^{-4} \times 3^7 = 3^n$ find the value n

[1 mark]

- (iii) Given that $\frac{5^{26} \times 5^m}{5^{13}} = 5^{17}$ find the value of m

[2 marks]

Question 6

An famous old steam train, *The Evening Star*, is making a special non-stop journey from Shrewsbury to London.

It leaves Shrewsbury at 10:23 and arrives in London at 13:08.

(i) How long, in hours and minutes, did the journey take ?

[2 marks]

(ii) Given that the distance between Shrewsbury and London is 260 km, what is the average speed of *The Evening Star* for the journey ?

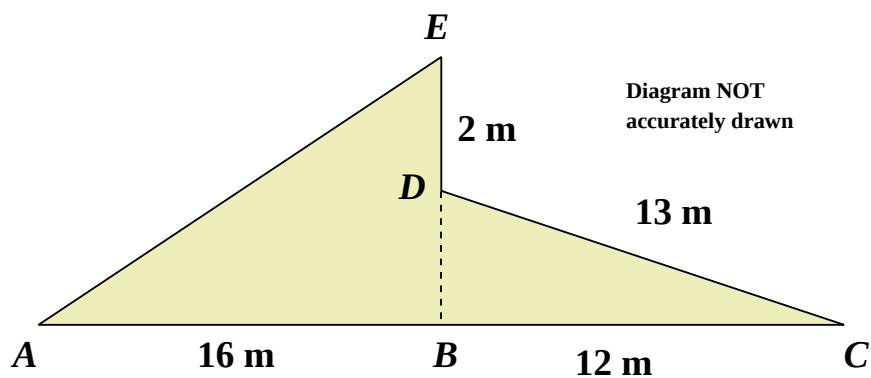
Give your answer in km/h

[3 marks]

Question 7

The diagram below shows the cross-section of a factory roof.

EDB is vertical and ABC is horizontal.



(i) Calculate the length BD .

[3 marks]

(ii) Calculate the area of the cross-section of the roof.

[3 marks]

Question 8

The table shows information about the numbers of children in 25 families.

Number of children in the family	Number of families (Frequency)
1	4
2	9
3	8
4	0
5	4

Work out the mean number of children in these 25 families.

[4 marks]

Question 9

Ophelia is trying to solve the following sandwich inequality,

$$13 \leq 3x + 7 \leq 22$$

Given that x is an integer, list the possible values of x

[3 marks]

Question 10

Solve, $\frac{12 - x}{3} = 7$

[3 marks]

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ANSWERS

Trial Trail Revision #2

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Answer 1

$$\begin{aligned} \text{(i)} \quad \text{Area } \Delta &= \frac{1}{2} \times \text{base} \times \text{height} \\ &= \frac{1}{2} \times 24 \times 7 \\ &= 84 \text{ cm}^2 \end{aligned}$$

[2 marks]

$$\text{(ii)} \quad h = \sqrt{24^2 + 7^2} = 25 \text{ cm}$$

[2 marks]

(iii) The perimeter is 56 cm

[1 mark]

Answer 2

$$\text{(i)} \quad x^2 - 9x + 14 \qquad \text{(ii)} \quad 4x^2 + 23x + 15$$

[2, 2 marks]

Answer 3

$$\text{(i)} \quad x = 108 - 60 = 48^\circ \qquad \text{(ii)} \quad y = \frac{180 - 48}{2} = 66^\circ$$

[2, 2 marks]

Answer 4

Method 1

$$5(x - 4) = 35$$

$$x - 4 = 7$$

$$x = 11$$

Method 2

$$5(x - 4) = 35$$

$$5x - 20 = 35$$

$$5x = 55$$

$$x = 11$$

[2 marks]

Answer 5

$$\text{(i)} \quad 1 \qquad \text{(ii)} \quad 3 \qquad \text{(iii)} \quad 4$$

[1, 1, 2 marks]

Answer 6

(i) 2 hours 45 minutes

[2 marks]

$$\begin{aligned}
 \text{(ii) } \quad \text{average speed} &= \frac{\text{Total Distance}}{\text{Total Time}} \\
 &= \frac{260}{2.75} \\
 &= 94.5 \text{ km/h}
 \end{aligned}$$

[3 marks]

Answer 7

(i) Use the Theorem of Pythagoras of $\triangle BCD$

$$BD = \sqrt{13^2 - 12^2} = 5 \text{ m}$$

[3 marks]

$$\begin{aligned}
 \text{(ii) } \quad \text{Total Area} &= \text{Area } \triangle ABE + \text{Area } \triangle BCD \\
 &= \frac{1}{2} \times 16 \times 7 + \frac{1}{2} \times 12 \times 5 \\
 &= 56 + 30 \\
 &= 86 \text{ m}^2
 \end{aligned}$$

[3 marks]

Answer 8

$$\begin{aligned}
 \text{mean} &= \frac{(1 \times 4) + (2 \times 9) + (3 \times 8) + (4 \times 0) + (5 \times 4)}{25} \\
 &= \frac{4 + 18 + 24 + 0 + 20}{25} = \frac{66}{25} = 2.64 \text{ children/family}
 \end{aligned}$$

[4 marks]

Answer 9

$$\begin{aligned}
 13 &\leq 3x + 7 \leq 22 \\
 6 &\leq 3x \leq 15 \\
 2 &\leq x \leq 5 \\
 \text{So } x &\in \{ 2, 3, 4, 5 \}
 \end{aligned}$$

[3 marks]

Answer 10

$$x = -9$$

[3 marks]

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Trial Trail Revision #3

IGCSE Mathematics
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Answer as many questions as you can
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Marks Available : 40

Question 1

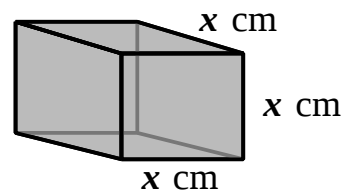
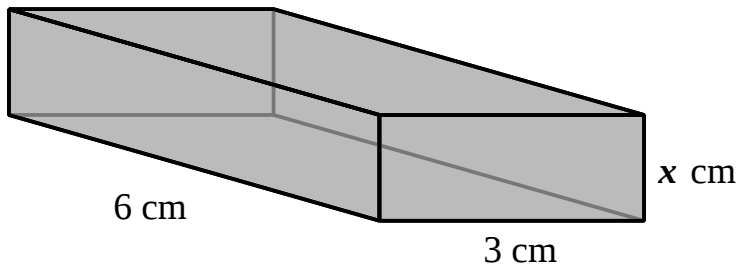
For his motorbike, Fergus buys x litres of petrol at 161 pence per litre.
He has to pay £30.59 in total for the petrol bought.

How many litres of petrol did Fergus buy ?

[2 marks]

Question 2

The diagram shows a cuboid and a cube.



The dimensions of the cuboid are x cm by 6 cm by 3 cm

The volume of the cuboid is 45 cm^3

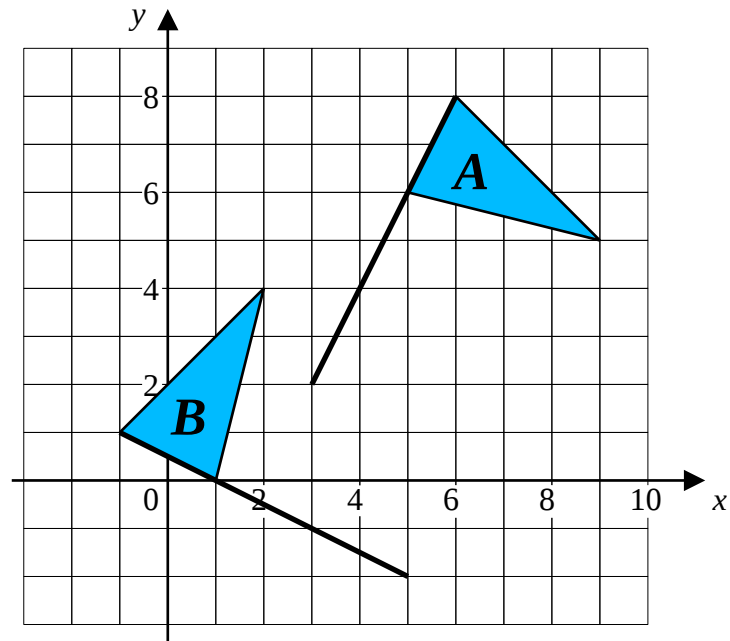
The cube has sides of length x cm

Work out the volume of the cube.

Give your answer correct to one decimal place.

[4 marks]

Question 3



The diagram shows two flags labelled **A** and **B**

- (i) Translate flag **A** by the vector $\begin{pmatrix} -4 \\ 1 \end{pmatrix}$

Label this new flag with the letter **C**

[2 marks]

- (ii) Find a single transformation that moves flag **A** to flag **B**

[3 marks]

Question 4

Solve these simultaneous equations;

$$5x + 6y = 9$$

$$2x + 3y = 3$$

[4 marks]

Question 5

Expand the brackets and simplify,

(i) $(3x + 5)(2x - 1)$ (ii) $(4x + 3)^2$

[3, 3 marks]

Question 6

Find the median of these five numbers;

43 28 37 30 12

[2 marks]

Question 7

Two similar shapes have an area scale factor between them of 25.
What is the length scale factor between the two similar shapes ?

[1 mark]

Question 8

Consider the functions, f and g , given by,

$$f(x) = 3x + 4$$

$$g(x) = 2x - 3$$

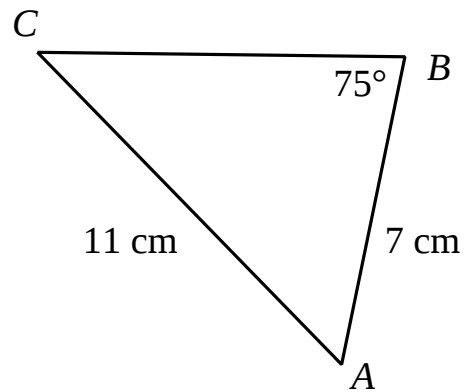
Calculate the value of:

(i) $f(7)$ (ii) $gg(11)$ (iii) $fg(4)$

[1, 2, 3 marks]

Question 9

The diagram shows triangle ABC



Calculate the size of angle BAC

Give your answer correct to 1 decimal place.

Show clear working.

[5 marks]

Question 10

Quadratic equations, which are of the form,

$$a x^2 + b x + c = 0$$

where a , b and c are constants, and x is a variable, have solutions given by,

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Consider the equation;

$$5x^2 + 7x + 2 = 0$$

Show how the above formula could be used to solve this equation.

[5 marks]

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ANSWERS

Trial Trail Revision #3

IGCSE Mathematics
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Answer 1

$$\begin{aligned}161x &= 3059 \\x &= \frac{3059}{161} \\&= 19 \text{ litres}\end{aligned}$$

[2 marks]

Answer 2

$$V_{CUBOID} = \text{length} \times \text{breadth} \times \text{height}$$

$$45 = 3 \times 6 \times h$$

$$\begin{aligned}h &= \frac{45}{3 \times 6} \\&= 2.5 \text{ cm}\end{aligned}$$

$$V_{CUBE} = x \times x \times x$$

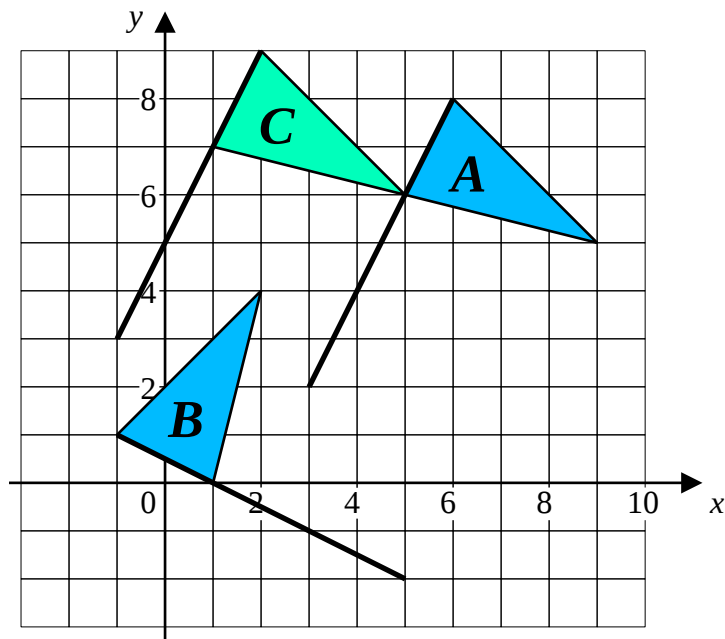
$$= 2.5 \times 2.5 \times 2.5 \text{ as } x = h$$

$$= 15.6 \text{ cm}^3$$

[4 marks]

Answer 3

(i)



[2 marks]

(ii) Rotation, 90° , about (6, 1)

[3 marks]

Answer 4

$$5x + 6y = 9 \Rightarrow 5x + 6y = 9$$

$$2x + 3y = 3 \Rightarrow 4x + 6y = 6 \quad \text{SUBTRACT}$$

$$x = 3 \Leftrightarrow y = -1$$

[4 marks]

Answer 5

(i) $6x^2 + 7x - 5$

(ii) $16x^2 + 24x + 9$

[3, 3 marks]

Answer 6

Put the data in order : 12 28 30 37 43

The median is 30

[2 marks]

Answer 7

5

[1 mark]

Answer 8

(i) $f(7) = 3 \times 7 + 4 = 25$

(ii) $g(g(11)) = g(19) = 35$

(iii) $fg(4) = f(5) = 19$

[1, 2, 3 marks]

Answer 9

STRATEGY : Get angle ACB first using reciprocal sine rule

$$\frac{\sin C}{c} = \frac{\sin B}{b}$$

$$\sin C = \frac{7 \times \sin 75}{11} = 0.615 \Leftrightarrow C = 37.9^\circ \text{ so } BAC = 67.1^\circ$$

[5 marks]

Answer 10

For the given equation, $a = 5$, $b = 7$, $c = 2$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-7 \pm \sqrt{7^2 - 4 \times 5 \times 2}}{2 \times 5} = \frac{-7 \pm \sqrt{49 - 40}}{10}$$

which gives $x = \frac{-7 \pm 3}{10}$ and final answers of $x = -1$ or $x = -0.4$

[5 marks]

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