



**THE CEDARS**  
**SCHOOL**

# I 3+ Entrance Examination

## MATHEMATICS

**Time allowed: 45 minutes**

**Answer all questions in the spaces provided.**

**Calculators may not be used.**

FIRST NAME: \_\_\_\_\_ SURNAME: \_\_\_\_\_

DATE OF BIRTH: \_\_\_\_\_



**Q1.** Work out which distance is longer,

30% of 320 miles      or       $\frac{1}{2}$  of 190 miles.

You **must** show your working.

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Answer .....

**(Total 4 marks)**

**Q2.(a)**    Simplify fully       $4a - 5a + 2b - 8b$

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.....

Answer .....

**(2)**

(b)    Factorize       $m^2 - 2m$

Answer .....

**(1)**

(c)    Multiply out       $7x(x - 1)$

.....

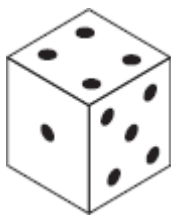
Answer .....

**(2)**

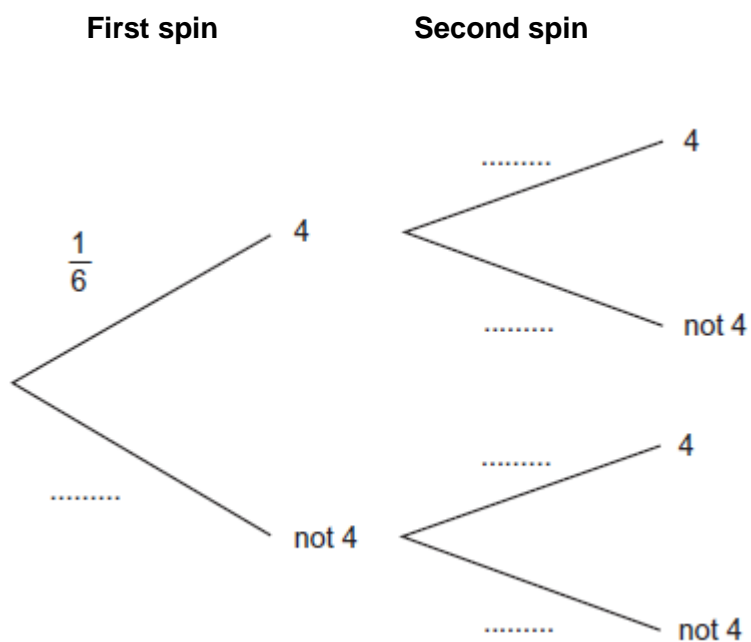
**(Total 5 marks)**

**Q3.**

An ordinary fair dice is rolled.



- (a) Complete the tree diagram for the dice landing on 4



(1)

- (b) Work out the probability of the dice NOT landing on 4 both times.

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Answer .....

(2)

(Total 3 marks)

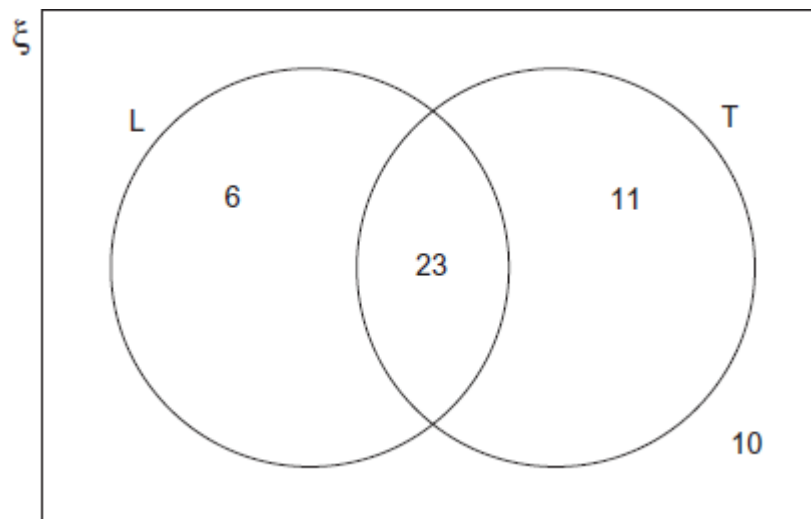
**Q4.**

Here is a Venn diagram.

It shows information about the number of students who have a laptop or a TV.

Set L represents students with a laptop.

Set T represents students with a TV.



There are 50 students altogether.

A student is chosen at random.

- (a) Work out the probability that the student has a laptop.

Answer .....

(1)

- (b) Work out the probability that the student has a laptop **and** a TV.

Answer .....

(1)

- (c) Complete the sentence to make it true.

The probability that the student

.....

..... is  $\frac{11}{50}$

(1)

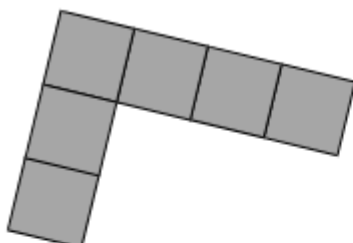
(Total 3 marks)

**Q5.**

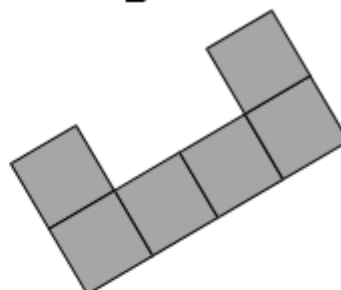
Which of these is the **net** of a **cube**?

Circle the correct letter.

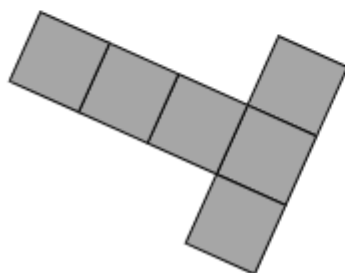
**A**



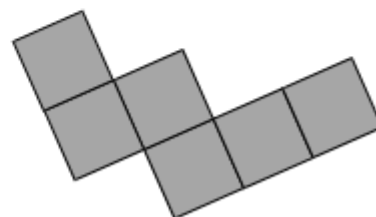
**B**



**C**



**D**



(Total 1 mark)

**Q6.** Here are three expressions.

$$\frac{b}{a}$$

$$a - b$$

$$ab$$

When  $a = 2$  and  $b = -6$  which expression has the **lowest** (*furthest left on the number line*) value?

You **must** show your working.

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.....

.....

Answer .....

(Total 2 marks)

**Q7.**

Sam wants to buy a camera for £345

He has already saved £96

Each week

his pay is £80

he saves 20% of this pay.

How many **more** weeks must he save?

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.....

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Answer ..... weeks

**(Total 4 marks)**

**Q8.**

The  $n$ th term of a sequence is  $2n + 1$

The  $n$ th term of a different sequence is  $3n - 1$

Work out the **three** numbers that are

in both sequences

and

between 20 and 40

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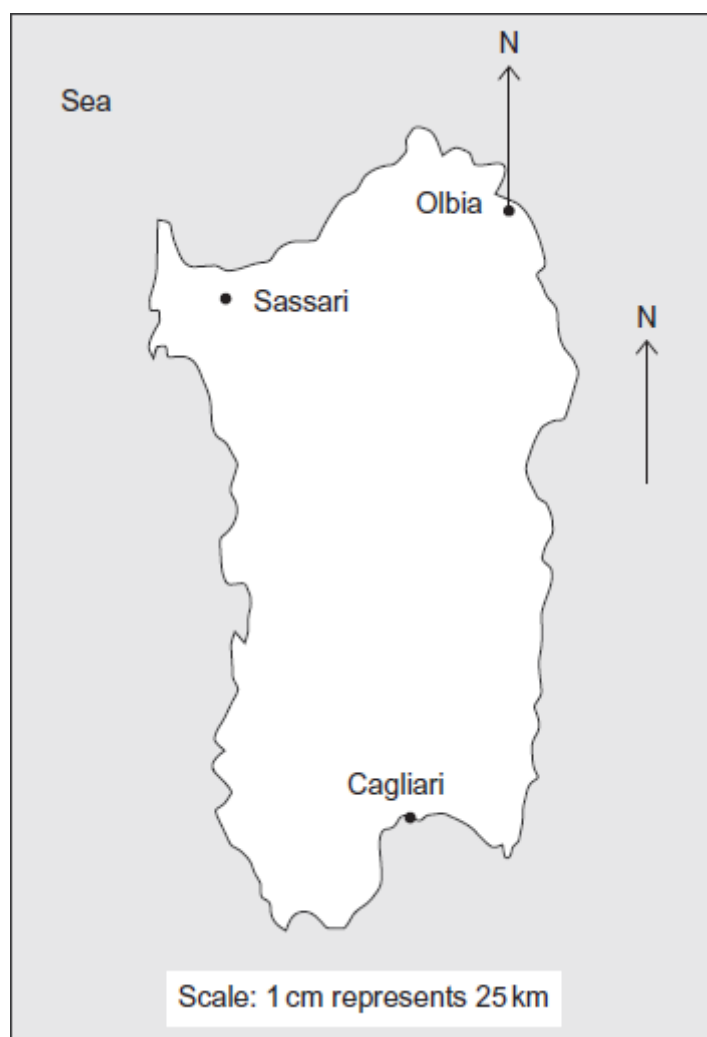
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Answer ....., ....., .....

**(Total 3 marks)**

**Q9.** Here is a map of Sardinia.



- (a) Work out the **actual** distance between Cagliari and Sassari.

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.....

Answer ..... km

(3)

- (b) Mario's favorite point along the whole coast is on a bearing of  $165^\circ$  from Olbia.

Draw this bearing **and** mark with a cross the position of this location.

(2)  
(Total 5 marks)



**Q10.(a)** Work out the Highest Common Factor (HCF) of 24 and 42

.....  
.....

Answer .....

(2)

(b) As a product of prime factors  $36 = 2^2 \times 3^2$

Write 48 as a product of prime factors.

.....  
.....

Answer .....

(2)

(Total 4 marks)

**Q11.(a)** The table shows the masses of planets in the form  $a \times 10^{24}$  kg

Planet	Mass (kg)
Mercury	$0.330 \times 10^{24}$
Venus	$4.87 \times 10^{24}$
Mars	$0.642 \times 10^{24}$
Jupiter	$1900 \times 10^{24}$
Saturn	$568 \times 10^{24}$

Write the mass of Jupiter in kilograms.  
Give your answer in standard form.

.....

Answer .....

(1)

- (b) The mass of the Earth is  $5.97 \times 10^{24}$  kg

The volume of the Earth is  $1.02 \times 10^{21}$  m<sup>3</sup>

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

**Calculate roughly** the density of the Earth.

Give your answer to an appropriate degree of accuracy.

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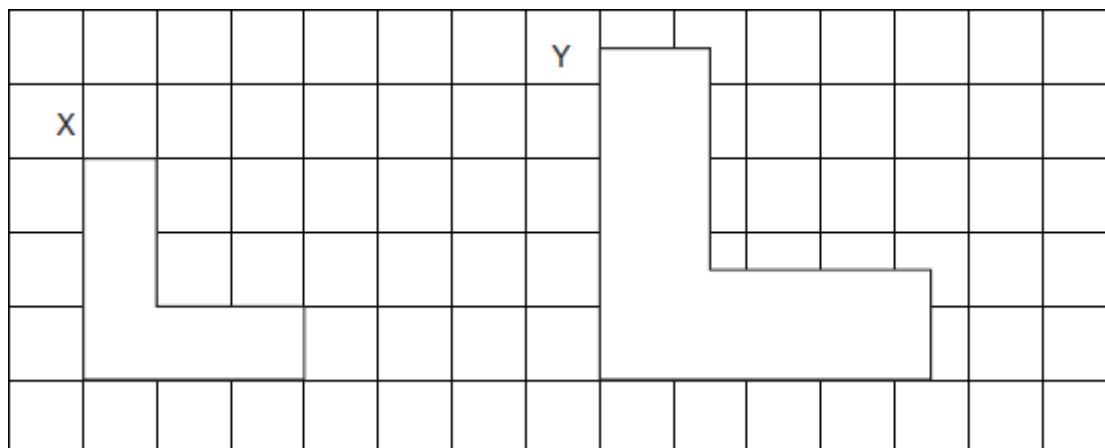
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Answer ..... kg / m<sup>3</sup>

(3)  
(Total 4 marks)

**Q12.**



- (a) Shape Y is an enlargement of shape X.

What is the scale factor of the enlargement?

Answer .....

(1)

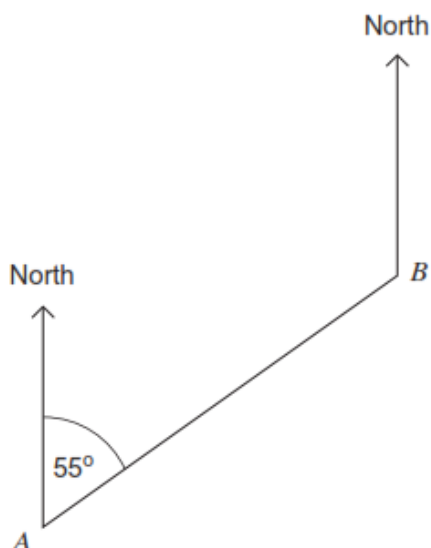
- (b) Shape X has a perimeter of 12 cm.

Work out the perimeter of shape Y.

Answer ..... cm

(1)  
(Total 2 marks)

**Q13.**  $A$  and  $B$  are two towns.



Here is a formula for working out the bearing of  $A$  from  $B$ .

$$T = F + 180^\circ$$

where  $T$  is the bearing of  $A$  from  $B$   
and  $F$  is the bearing of  $B$  from  $A$

- (a) Use the diagram and the formula to work out the bearing of  $A$  from  $B$ .

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Answer .....°

(2)

- (b) Give a reason why the formula can only be used for  $0^\circ < F \leq 180^\circ$

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.....

(1)

- (c) The bearing of  $C$  from  $D$  is  $342^\circ$ .

Work out the bearing of  $D$  from  $C$ .

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.....

Answer .....°

(2)

(Total 5 marks)

