

First name	
Last name	
School	

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CE AT 13+

# CORE MATHEMATICS

**ISEB**

Independent Schools  
Examinations Board

## Specimen Non-Calculator Paper

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Date

Time allowed: 60 minutes

### Instructions

Answer as many questions as you can.

**You must show all your working, or you may receive no marks.**

You are encouraged to cross out mistakes neatly, not erase them.

Answers given as fractions should be reduced to their lowest terms and written as mixed numbers where appropriate.

**Answers should include correct units where necessary.**

A row of dots ..... shows where to write an answer.

Grey boxes are for your working, but extra working can be done anywhere on the paper.

If there is no row of dots, you should double underline your answer with your working in a grey box.

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1. (a) Write the correct sign,  $<$  ,  $>$  or  $=$  between each pair.

(i)  $6.4 \dots\dots 6.8$

(ii)  $8.7 \dots\dots 8.14$

(iii)  $5.9 \dots\dots 5.09$

(iv)  $7.6 \dots\dots 7.60$

(v)  $32.4 \dots\dots 3.24$

(vi)  $\frac{3}{5} \dots\dots \frac{6}{10}$

[4]

(b) Circle the correct answers.

(i) In the number **376.91** , what does the **7** stand for?

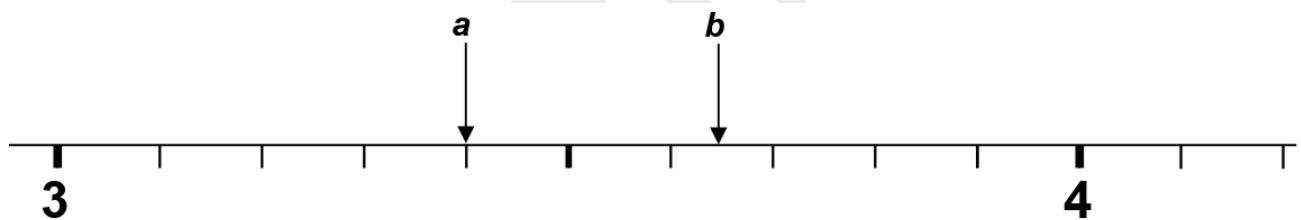
**seven tenths      seventy      seven hundred      seven hundredths**

(ii) In the number **23.574** , what does the **7** stand for?

**seven tenths      seventy      seven hundred      seven hundredths**

[2]

(c) Write the numbers the arrows point to on the number line below.



Answers: **a** = ..... , **b** = ..... [2]

2. Work out

(i)  $3 + 2 \times 4$

(ii)  $(7 + 3) \times 5$

(iii)  $\frac{20 - 2 \times 3 + 4}{3}$

[6]

3. Calculate

(i)  $7.61 - 2.8$

(ii)  $42.6 \times 0.8$

(iii)  $7.6 \div 5$

[illegible]

Answers: .....

[6]

4. Use the fact that  $64 \times 32 = 2048$  to complete these:

(i)  $6.4 \times 320$

(ii)  $2048 \div 32$

\_\_\_\_\_

=====

(iii) 32 x 32

(iv)  $650 \times 320$

= .....

\_\_\_\_\_

[4]

## 5. Calculate

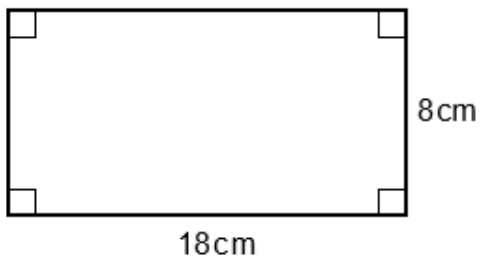
(i)  $\frac{5}{7}$  of 280

(ii) 5% of 120 kg

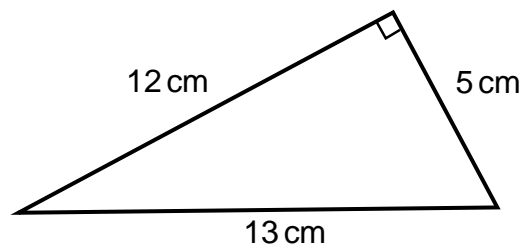
[5]

6. Calculate the **area** of each shape.

(i)



(ii)



[6]

7. Change to decimals

(i)

$$\frac{3}{5}$$

(ii)

$$\frac{7}{20}$$

[4]

8. (a) Write these as **products of prime factors**.

(i) 72

(ii) 180

[4]

- (b) Find the smallest number you need to multiply 180 by to make a square number.

[1]

9. Calculate

(i)  $\frac{7}{8} - \frac{1}{8}$

(ii)  $\frac{5}{9} + \frac{1}{6}$

(iii)  $\frac{9}{20} \div \frac{6}{25}$

[6]

10. A pony eats  $\frac{4}{9}$  of a bale of hay each day.

How many bales of hay will it eat in 45 days?



[3]

11. If  $a = 5$  ,  $b = -4$  and  $c = 3$  , find the value of

(i)  $3a + 2b$

(ii)  $b^2 - a$

(iii)  $\frac{4a - b}{2}$

(iv)  $(2a)^2 - 2c^2$

[8]

12. Solve

(i)  $5z - 2 = 33$

(ii)  $\frac{3m + 1}{3} = 4$

[4]

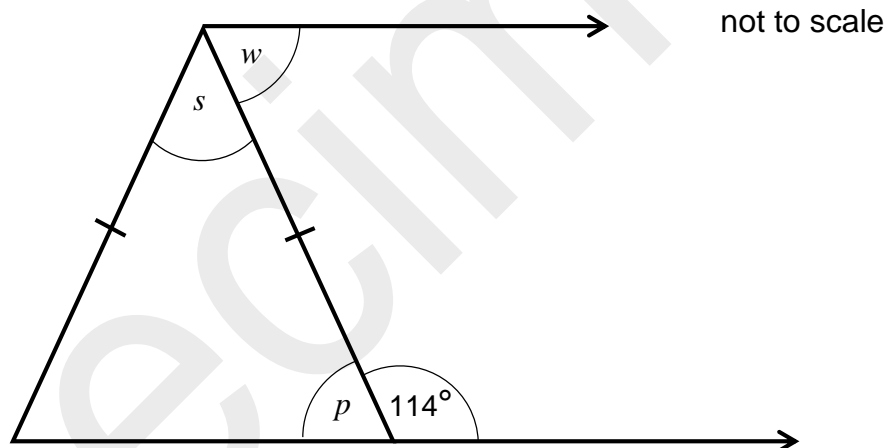
13. **Estimate** the value of

(i)  $3.92 \times 12.17$

(ii) 
$$\frac{148.07}{29.94}$$

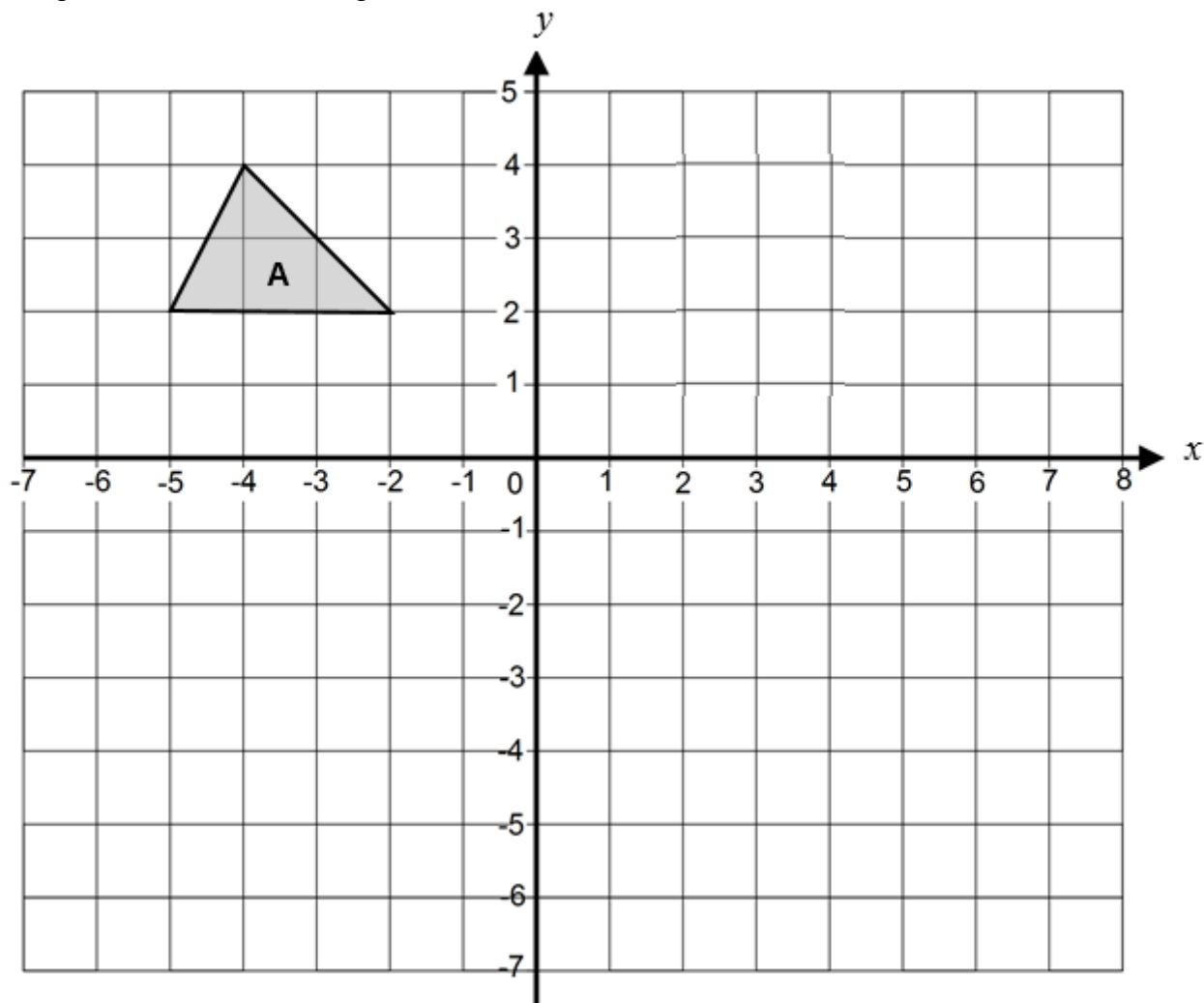
[4]

14. Calculate the size of each lettered angle.



[5]

15. Triangle **A** is drawn on the grid below.



- (i) **Reflect** triangle **A** in the  $y$ -axis.

Label the new triangle **B**.

[2]

- (ii) **Reflect** triangle **B** in the line  $y = -1$

Label the new triangle **C**.

[3]

- (iii) A **rotation** can map triangle **C** onto triangle **A**.

Plot the centre of the rotation and label it  $P$ .

Write the coordinates of  $P$  and the angle of rotation.

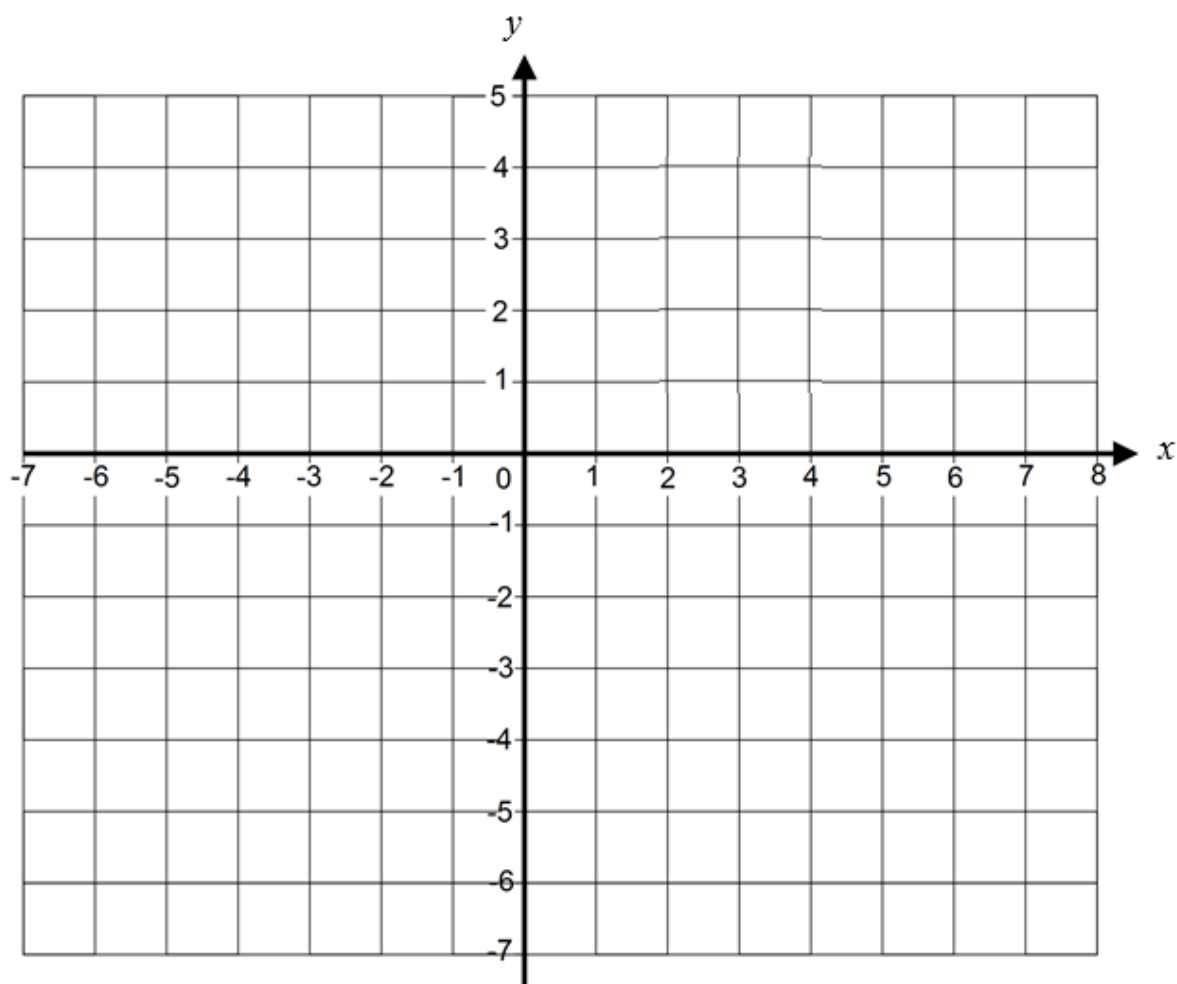
coordinates: .....

angle: .....

[3]

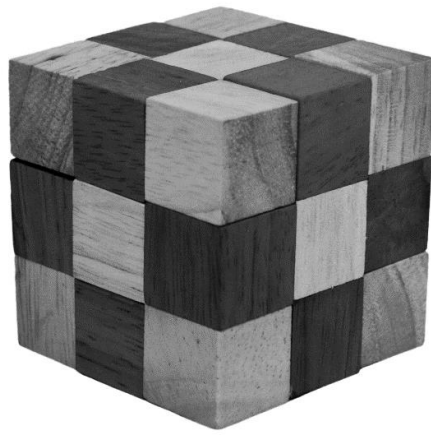
16. On the centimetre-square grid below, draw and label the line

$$y = 2x - 6$$



[3]

17.= A big 3 cm by 3 cm by 3 cm cube is made up of 27 small cubes.



The big cube is cut up with a saw.

Find the smallest numbers of cuts needed to separate the big cube into 27 small cubes.

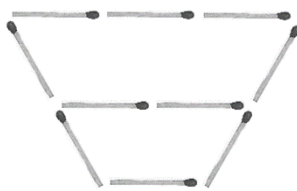
A large empty rectangular box for writing the answer.

[3]

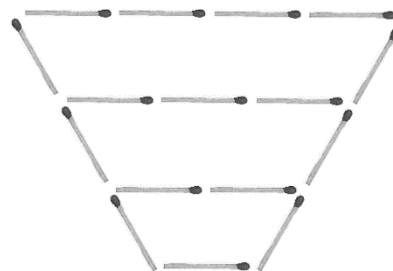
18. Look at the sequence of patterns made from matches.



**pattern 1**



**pattern 2**



**pattern 3**

(a) How many matches would you need to make **pattern 6**?

[3]

The **area** inside **pattern 1** is 3 units<sup>2</sup>.

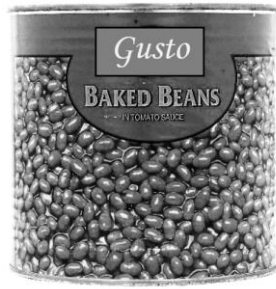
(b) Write down the size of the **area** inside **pattern 3**

Answer: ..... [1]

(c) Which pattern in the sequence would have an area of 143 units<sup>2</sup>?

[2]

19. Compare these prices for beans.



**£3.45**



**38p**

*Gusto* beans come in very large **2.7kg** tins for **£3.45** each.

*Trump's Original* beans come in **300g** tins for **38p** each.

Show which tin is the better value for money.

[3]

20. A plane can carry 214 passengers when full.

The price of a ticket for **each seat** is **£67**

How much **money** will the airline take if the plane flies **half full**?



[3]

(Total marks: 100)