Cambridge Assessment International Education

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MATHEMATICS **0580/33**

Paper 3 (Core) **May/June 2021**

2 hours

You must answer on the question paper.

You will need: Geometrical instruments

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should use a calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For π, use either your calculator value or 3.142.

INFORMATION

- The total mark for this paper is 104.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **20** pages. Any blank pages are indicated.

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1 Ray owns an electrical shop.

View solution

(a) The table shows the opening times of the shop.

Sunday	Closed
Monday	Closed
Tuesday	08 00 to 12 30 and 13 30 to 17 00
Wednesday	08 00 to 12 30 and 13 30 to 17 00
Thursday	08 00 to 12 30 and 13 30 to 17 00
Friday	08 00 to 12 30 and 13 30 to 17 00
Saturday	08 00 to 13 00 and 14 00 to 19 00

Work out how many hours the shop is open in one week.

..... hours [3]

(b) Saeed buys 2 ovens costing $440 each, 4 grills costing $184 each and 3 fridges costing $1280 each.

View solution

Calculate the total cost.

$ ..... [3]

(c) Alice buys 3 batteries costing $2.85 each.

View solution

Work out how much change she receives from $10.

$ ..... [2]

(d) Cherie works 32 hours one week and she is paid $8.48 per hour.
In another week she works 37 hours.
For each hour over 32 hours she works, she is paid 1.25 times her hourly rate.

View solution

Calculate her pay for the week she works 37 hours.

$ ..... [4]

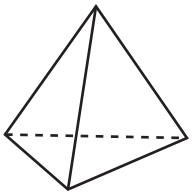
(e) Ray buys a toaster for $36.
When he sells it he makes a profit of 40%.

View solution

Calculate the selling price of this toaster.

$ ..... [2]

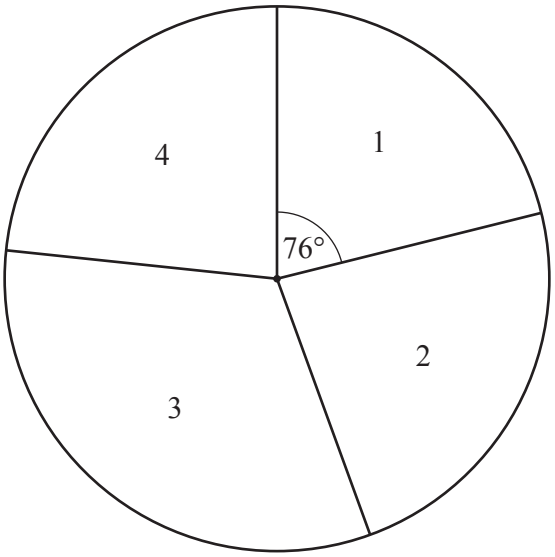
2



Mei and Jian each make a four-faced dice as shown in the diagram.
The faces on each dice are numbered 1, 2, 3 and 4.

(a) Mei throws her dice 90 times and records the scores.
The pie chart shows the results.

View solution



(i) Write down the mode.

..... [1]

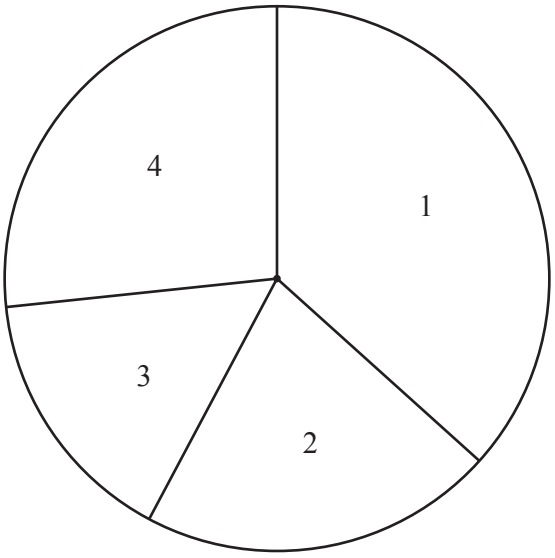
(ii) Work out how many times she scores 1.

View solution

..... [2]

(b) Jian throws his dice 90 times and records the scores.
The pie chart shows the results.

View solution



Write down the median.

..... [1]

(c) Write down two different comparisons between the results for Mei and the results for Jian.

View solution

1. .....

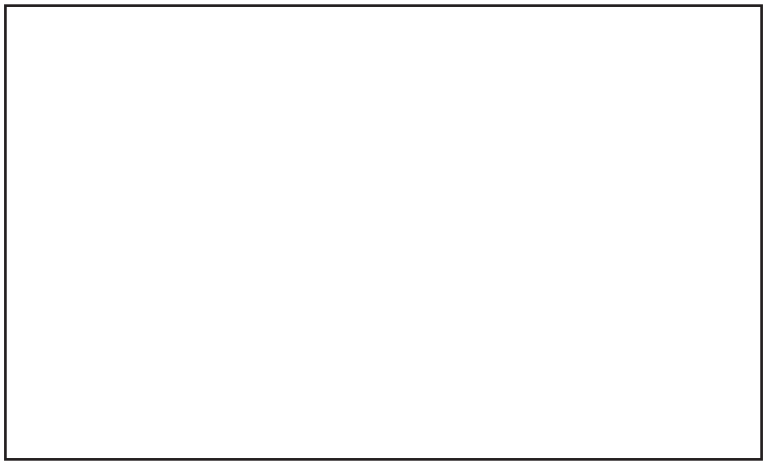
.....

2. .....

..... [2]

3 **(a)** The diagram shows a scale drawing of Joel's rectangular garden.
The scale is 1 centimetre represents 8 metres.

View solution



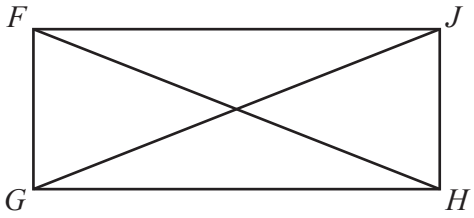
Scale: 1 cm to 8 m

Find the actual area of his garden.

..... m^2 [3]

(b) The diagram shows a rectangular gate, *FGHJ*, in Joel's garden.

View solution



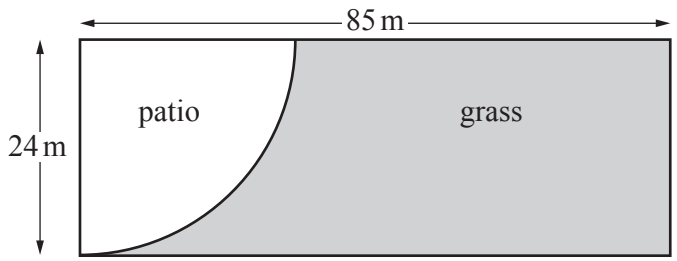
NOT TO SCALE

$GJ = 2.1$ m and $FG = 0.85$ m.

Find *FJ*.

FJ = ... m [3]

(c)



NOT TO SCALE

View solution

The diagram shows Brenda's rectangular garden.
There is a patio in the shape of a quarter-circle.

She wants to grow grass in the shaded part of the garden.
She needs 40 g of grass seed per square metre.
Grass seed is sold in 1 kg bags which cost $6.80 per bag.

Calculate the cost of the grass seed she needs to buy.

$ ..... [6]

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4 **(a)** Simplify.

$3a - 5b + 2a + b$

View solution

..... [2]

(b) $P = 3x^2 - xy$

View solution

Find the value of y when $P = 90$ and $x = 5$.

$y =$ ..... [3]

(c) Factorise completely.

View solution

(i) $6x - 18$

..... [1]

(ii) $25x^2 + 10x$

View solution

..... [2]

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(d) $T = 8d - 3$

Make d the subject of this formula.

View solution

$d =$ ..... [2]

(e) Solve these equations.

View solution

(i) $\frac{x}{6} = 12$

$x =$ ..... [1]

(ii) $7x - 4 = 3x + 2$

View solution

$x =$ ..... [2]

5 **(a)** Find.

(i) $\sqrt{320.41}$

View solution

..... [1]

(ii) $6.4^2 + 1.2^3$

View solution

..... [1]

(iii) the reciprocal of 2

View solution

..... [1]

(iv) 9^0

View solution

..... [1]

(v) $\frac{3}{7}$ of \$42

View solution

\$ ..... [1]

(vi) 12% of \$62

View solution

\$ ..... [1]

(b) Insert one pair of brackets in each statement to make it correct.

View solution

(i) $20 - 5 \div 5 - 3 = 0$ [1]

(ii) $20 - 5 \div 5 - 3 = 17.5$ [1]

View solution

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(c) Write one of the symbols $<$, $>$ or $=$ in each statement to make it correct.

View solution

$\frac{7}{10}$ 0.07

$\frac{1}{5}$ 20%

$\frac{3}{8}$ 0.38

[2]

(d) (i) Write 90 as the product of its prime factors.

View solution

..... [2]

(ii) Find the lowest common multiple (LCM) of 35 and 90.

View solution

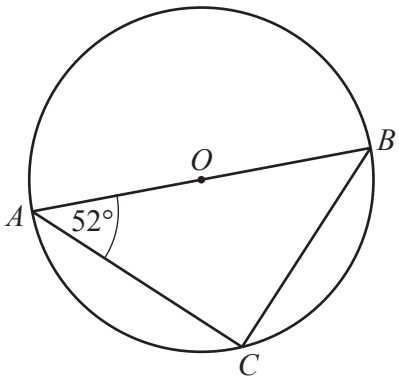
..... [1]

(iii) Find the highest common factor (HCF) of 35 and 90.

View solution

..... [1]

6 (a)



NOT TO SCALE

View solution

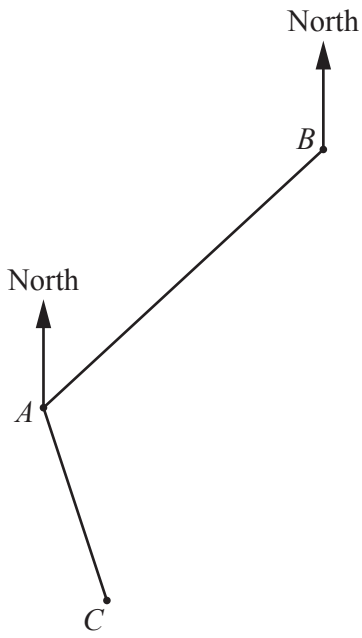
AB is the diameter of a circle, centre O.
C is a point on the circle and angle $BAC = 52°$.

Find angle ABC.

Angle $ABC =$ ..... [2]

(b) The diagram shows the positions of town A, town B and town C.

View solution



NOT TO SCALE

The bearing of town B from town A is 042°.
The bearing of town C from town A is 146°.

(i) Find angle BAC.

Angle $BAC =$ ..... [2]

(ii) Find the bearing of town A from town B.

View solution

..... [2]

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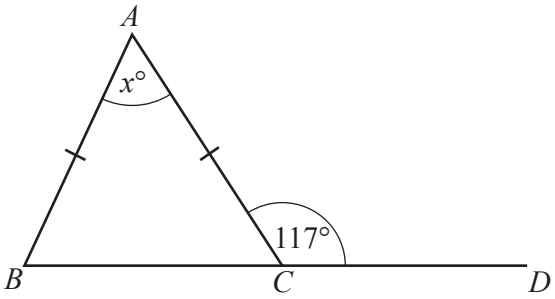
(c)

View solution



NOT TO SCALE

Triangle ABC is isosceles with $AB = AC$.
BCD is a straight line and angle $ACD = 117°$.

Find the value of x.

$x =$ ..... [3]

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7 Rita and Henry own an investment business.

(a) They share the profit in the ratio Rita : Henry = 3 : 5.
In one year they make a profit of $2 400 000.

View solution

Calculate Rita's share of the profit.

$ ..... [2]

(b) Henry invests $160 000 at a rate of 2.5% per year compound interest.

View solution

Calculate the value of this investment at the end of 3 years.

$ ..... [2]

(c) Rita invests $12 000 at a rate of r% per year.
The value of her investment at the end of one year is $12 408.

View solution

Work out the value of r.

$r =$ ..... [2]

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(d) Rita and Henry decorate their office.
The cost, $\$c$, is \$10 800, correct to the nearest hundred dollars.

View solution

Complete this statement about the value of c.

..... $\leqslant c <$ ..... [2]

8 **(a)** 15 people take a test.
These are the test scores.

View solution

29	27	12	32	42
26	7	23	22	31
40	9	18	35	8

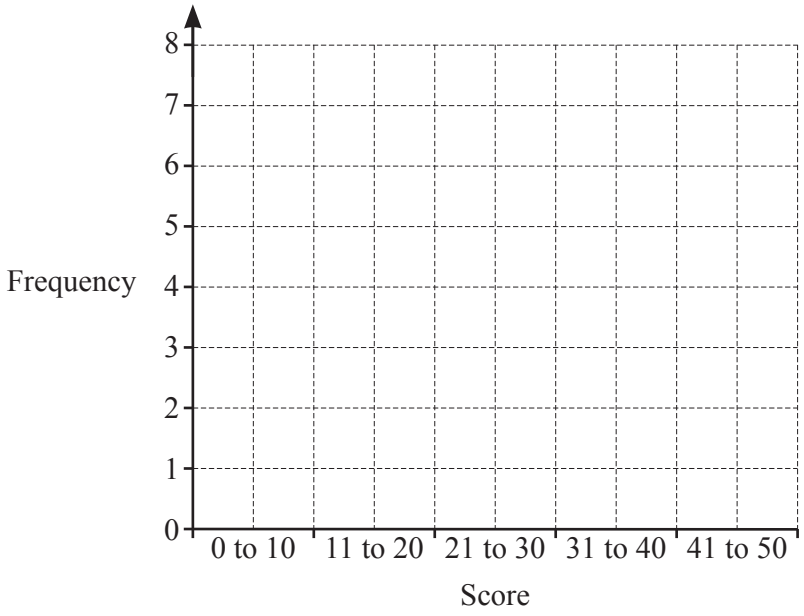
(i) Complete the frequency table.
You may use the tally column to help you.

Score	Tally	Frequency
0 to 10		
11 to 20		
21 to 30		
31 to 40		
41 to 50		

[2]

(ii) Use your table to complete the bar chart.

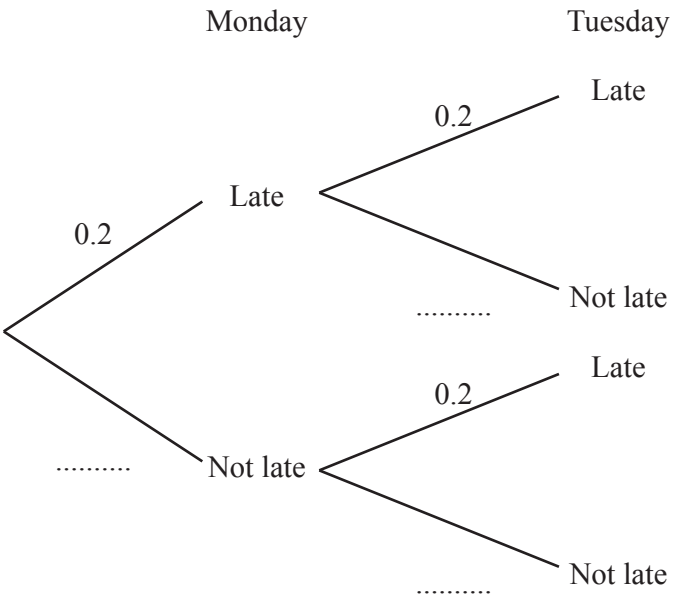
View solution



[2]

(b) On Monday and Tuesday, the probability that a train is late is 0.2 .

View solution



(i) Complete the tree diagram. [1]

(ii) Use the tree diagram to find the probability that a train is

View solution

(a) late on both days,

..... [2]

(b) not late on Monday and late on Tuesday.

..... [2]

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9 The table shows some values for $y = x^2 + x - 5$.

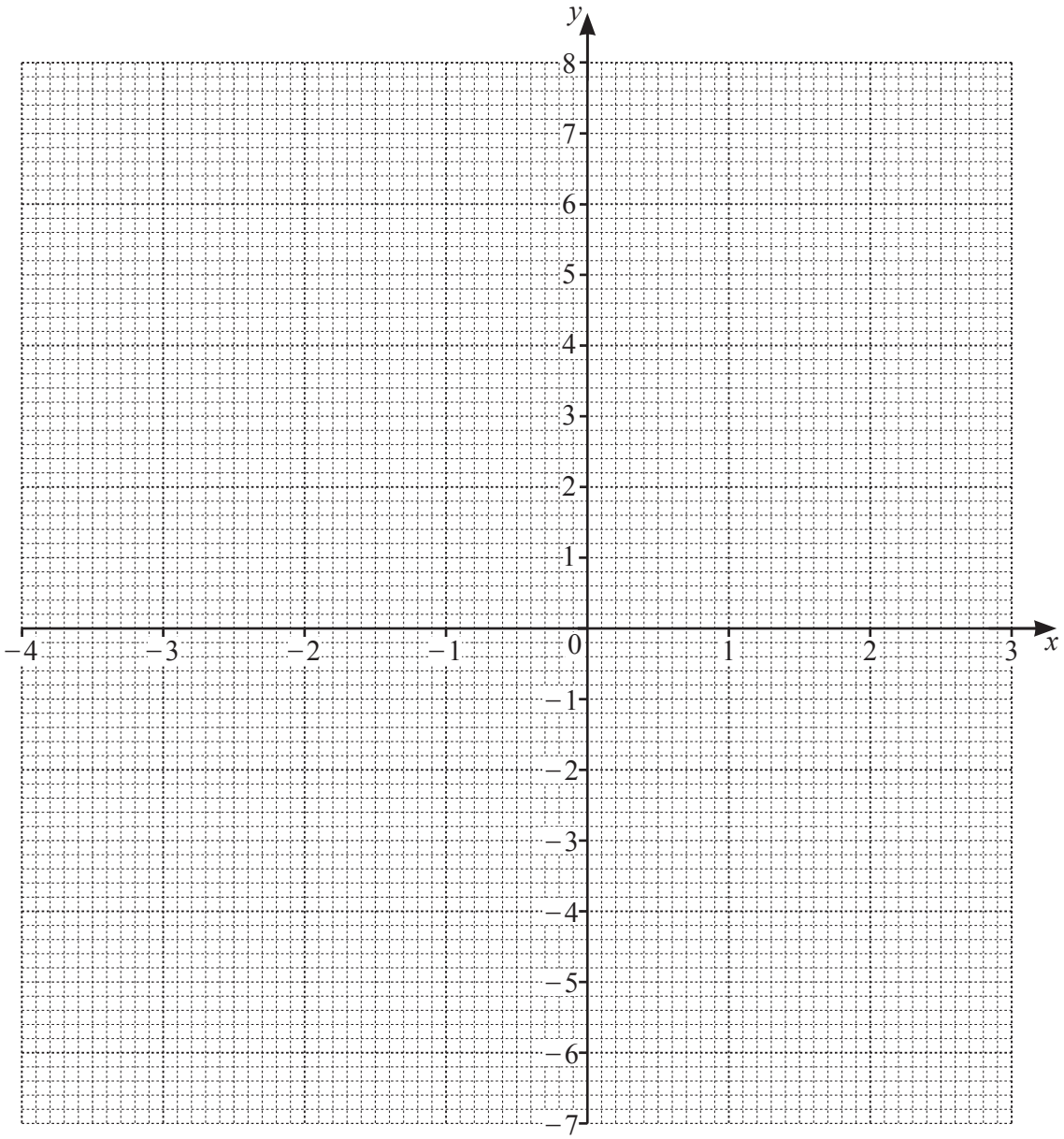
x	-4	-3	-2	-1	0	1	2	3
y	7		-3	-5	-5			7

View solution

(a) Complete the table. [2]

(b) Draw the graph of $y = x^2 + x - 5$ for $-4 \leqslant x \leqslant 3$.

View solution



[4]

(c) Write down the equation of the line of symmetry of this graph.

View solution

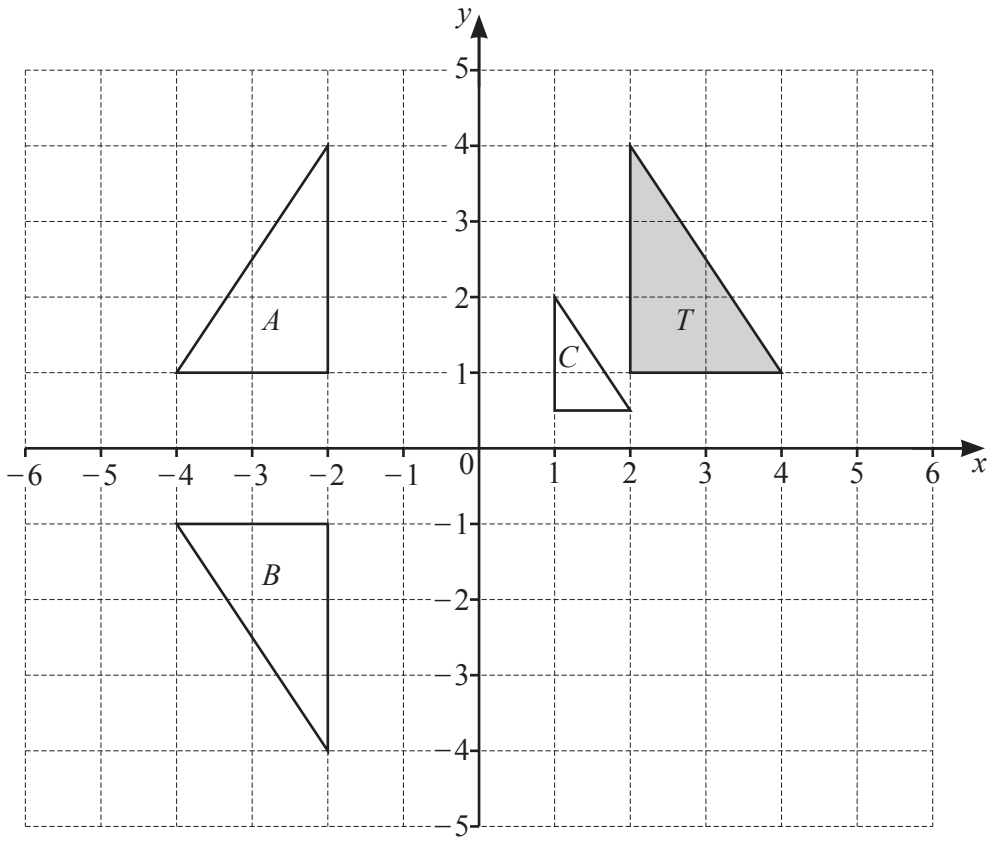
..... [1]

(d) Use the graph to solve the equation $x^2 + x - 5 = 0$.

View solution

$x =$ ..... or $x =$ ..... [2]

10 The diagram shows four triangles on a grid.



View solution

(a) On the grid, translate triangle T by the vector $\begin{pmatrix} 2 \\ -5 \end{pmatrix}$. [2]

View solution

(b) Describe fully the **single** transformation that maps

(i) triangle T onto triangle A,

.....

..... [2]

(ii) triangle T onto triangle B,

View solution

.....

..... [3]

(iii) triangle T onto triangle C.

View solution

.....

..... [3]

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