

Write your name here

Surname

Other Names

# Mathematics

## November 2022 Practice Paper 1 (Non-Calculator)

### Foundation Tier

Time: 1 hour 30 minutes

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – there may be more space than you need.
- **Calculators may not be used.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**



### Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets – use this as a guide as to how much time to spend on each question.

### Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

## Foundation Tier Formulae Sheet

### Perimeter, area and volume

Where  $a$  and  $b$  are the lengths of the parallel sides and  $h$  is their perpendicular separation:

$$\text{Area of a trapezium} = \frac{1}{2}(a + b) h$$

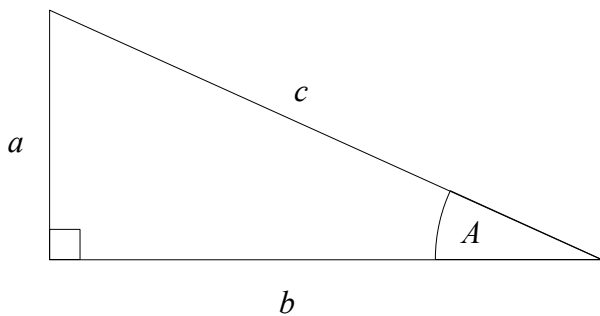
Volume of a prism = area of cross section  $\times$  length

Where  $r$  is the radius and  $d$  is the diameter:

$$\text{Circumference of a circle} = 2\pi r = \pi d$$

$$\text{Area of a circle} = \pi r^2$$

### Pythagoras' Theorem and Trigonometry



In any right-angled triangle where  $a$ ,  $b$  and  $c$  are the length of the sides and  $c$  is the hypotenuse:

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

In any right-angled triangle  $ABC$  where  $a$ ,  $b$  and  $c$  are the length of the sides and  $c$  is the hypotenuse:

$$\sin A = \frac{a}{c} \quad \cos A = \frac{b}{c} \quad \tan A = \frac{a}{b}$$

### Compound Interest

Where  $P$  is the principal amount,  $r$  is the interest rate over a given period and  $n$  is number of times that the interest is compounded:

$$\text{Total accrued} = P \left( 1 + \frac{r}{100} \right)^n$$

### Probability

Where  $P(A)$  is the probability of outcome  $A$  and  $P(B)$  is the probability of outcome  $B$ :

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

**END OF EXAM AID**

1 Write 0.03 as a fraction.

$$\frac{3}{100}$$

(Total for Question 1 is 1 mark)

2 Simplify  $n + n + n$

$$3n$$

(Total for Question 2 is 1 mark)

3 Change 48 cm to mm.

.....480.....mm

(Total for Question 3 is 1 mark)

4 Work out  $2^4$

$$2 \times 2 \times 2 \times 2$$

$$16$$

(Total for Question 4 is 1 mark)

5 Work out  $20 - 2 \times 7$

$$20 - 14$$

$$6$$

(Total for Question 5 is 1 mark)

6 Here is a list of 10 numbers.

2 3 4 4 4 5 6 6 7 7

Find the mode.

most common

.....4.....

(Total for Question 6 is 1 mark)

7 Write down two factors of 12

$$1 \times 12$$

$$2 \times 6$$

$$3 \times 4$$

Any of 1, 2, 3, 4, 6 and 12

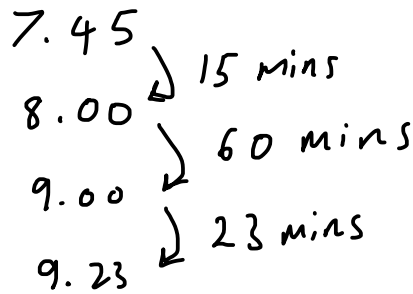
3 and 4

(Total for Question 7 is 2 marks)

8 A film starts at 7.45 pm.  
The film lasts 98 minutes.

What time does the film finish?

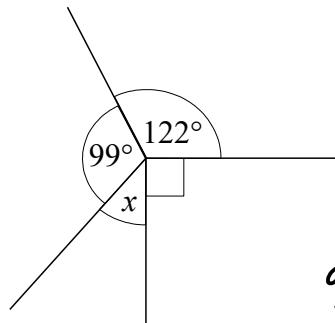
$$98 - 75 = 23$$



9.23 pm

(Total for Question 8 is 2 marks)

9



$$99 + 122 = 221$$

$$360 - 90 = 270$$

(a) Work out the size of the angle marked  $x$ .

$$\begin{array}{r} 270 \\ - 221 \\ \hline 49 \end{array}$$

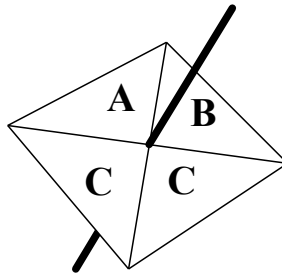
49°

(b) Give a reason for your answer.

Angles around a point add to 360°

(Total for Question 9 is 2 marks)

10 Stevie spins a fair 4-sided spinner.



(a) On the probability scale mark with a cross (X) the probability that the spinner lands on A.



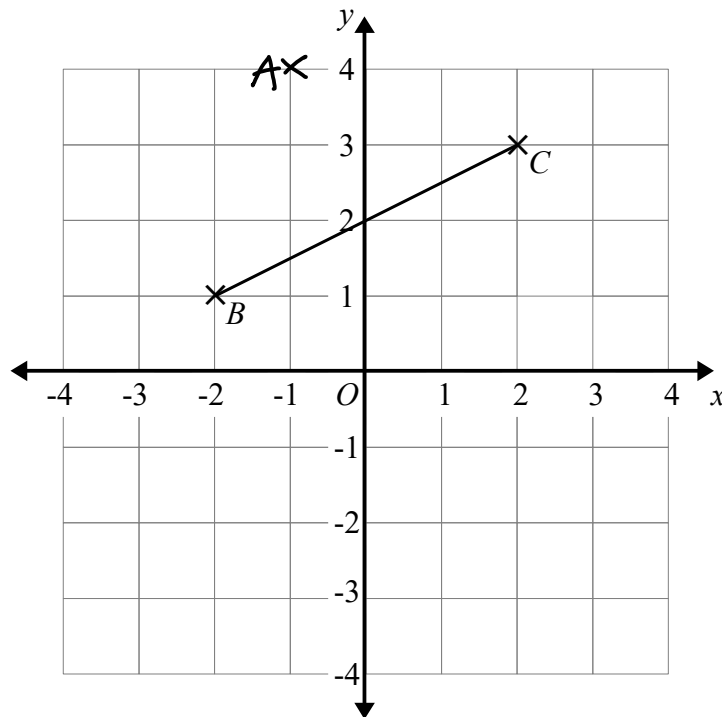
(b) Write down the probability that the spinner lands on C.

$\frac{1}{2}$

(1)

**(Total for Question 10 is 2 marks)**

11



(a) Plot the point with coordinates  $(-1, 4)$ .  
Label this point *A*.

(1)

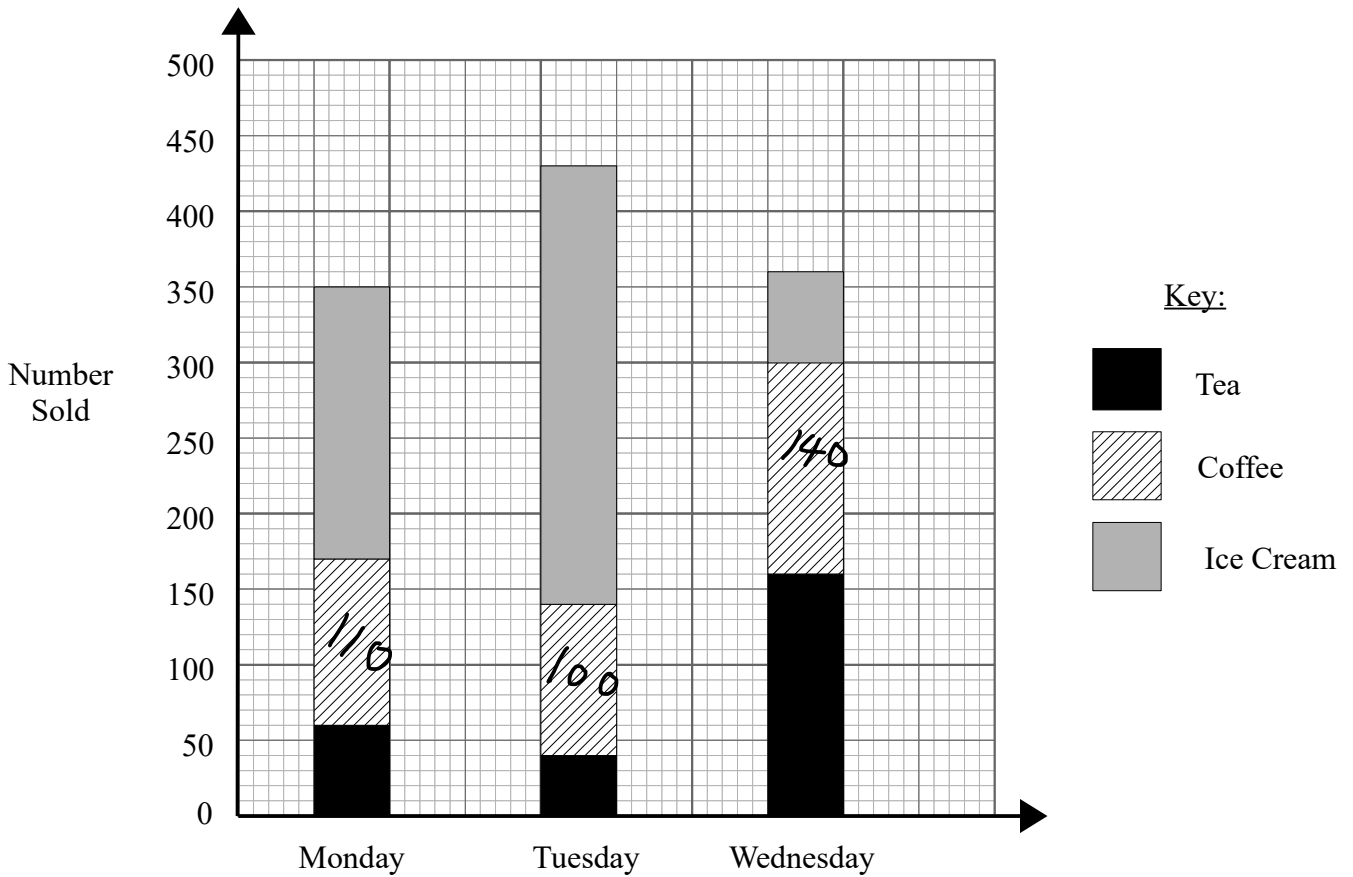
(b) Write down the coordinates of the midpoint of *BC*.

(....., .....)

(1)

**(Total for Question 11 is 2 marks)**

- 12 A shop sells teas, coffees and ice creams.  
The composite bar chart shows information about sales on Monday, Tuesday and Wednesday.



(a) Write down the number of Teas sold on Monday.

.....60  
(1)

(b) Work out the total number of Coffees sold on Monday, Tuesday and Wednesday.

$$\begin{array}{r}
 110 \\
 100 \\
 + 140 \\
 \hline
 350
 \end{array}$$

.....350  
(3)

(Total for Question 12 is 4 marks)

13 Mason wants to buy 6 pens.

Each pen costs 28p

Mason pays with a £10 note.

(a) Work out how much change Mason will get from £10.

$$\begin{array}{r} 28 \\ \times 6 \\ \hline 168 \\ 4 \phantom{0} \\ \hline \end{array}$$

$$\begin{array}{r} \cancel{10} \cancel{0} \cancel{6} \\ - 168 \\ \hline 832 \end{array}$$

£ 8.32  
(2)

(b) When in the shop Mason finds out that the price of the pens has been reduced.

How does this affect the amount of change he will get?

The amount of change will increase

(1)

(Total for Question 13 is 3 marks)

14 The normal price of a computer game is £40

The price is reduced by  $\frac{1}{5}$  in a sale.

Work out the price of the computer game in the sale.

$$\frac{1}{5} \text{ of } 40 = 40 \div 5 = 8$$

$$40 - 8 = 32$$

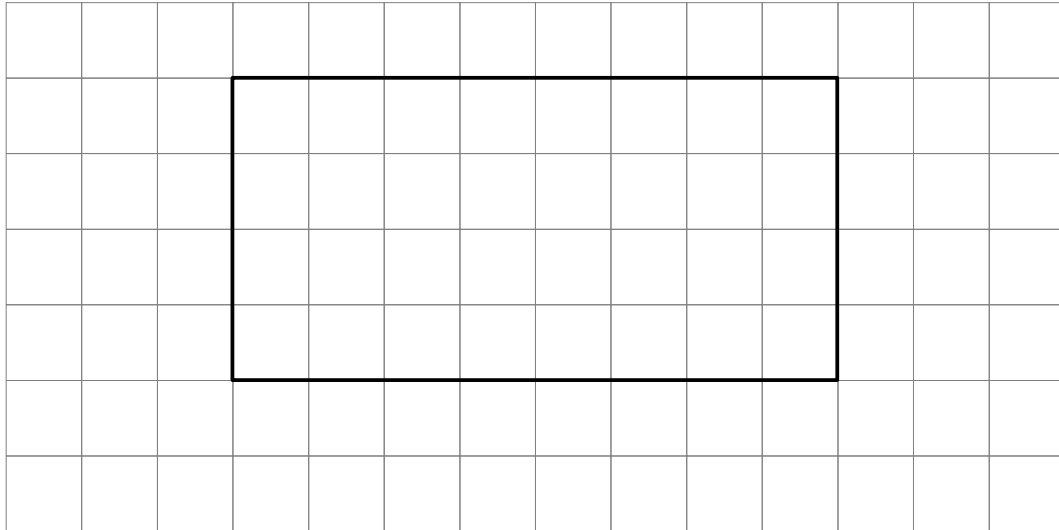
£ 32

(Total for Question 14 is 2 marks)

- 15 The length of a rectangle is two times the width of the rectangle.  
The perimeter of the rectangle is 24 cm.

Draw the rectangle on the centimetre grid.

4 and 8



(Total for Question 15 is 2 marks)

- 16 It costs £0.75 to buy 5 bananas.

Work out how much it would cost to buy 7 bananas.

$$5 \overline{) 75}$$

15p per banana

$$\begin{array}{r} 15 \\ \times 7 \\ \hline 105 \end{array}$$

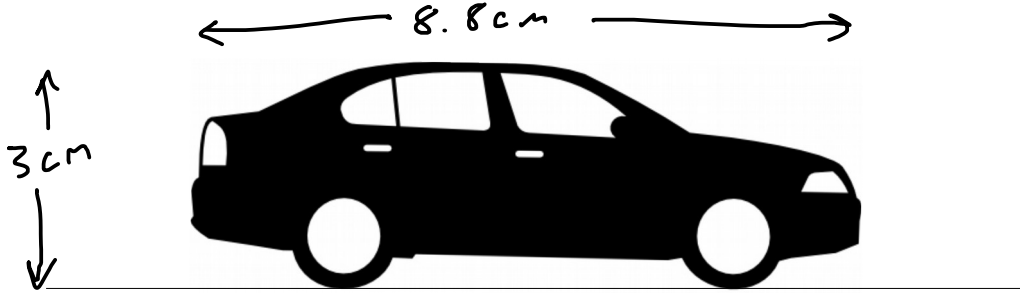
105p for 7

£1.05

(Total for Question 16 is 2 marks)



- 17 The accurate scale drawing shows a car.



The car has a real height of 1.5 metres.

Find an estimate for the real length, in metres, for the car.

$$\begin{aligned} 3 \text{ cm} &: 1.5 \text{ m} \\ 1 \text{ cm} &: 0.5 \text{ m} \\ 8.8 \text{ cm} &: 4.4 \text{ m} \end{aligned}$$

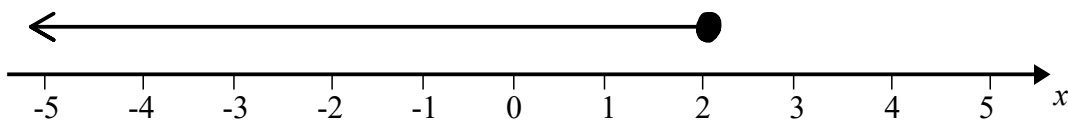
.....4.4..... metres

(Total for Question 17 is 2 marks)

- 18 Solve  $4x \leq x + 6$

Show your answer on the number line.

$$\begin{aligned} 4x &\leq x + 6 \\ 3x &\leq 6 \\ x &\leq 2 \end{aligned}$$



(Total for Question 18 is 3 marks)

19 Abbie runs a distance of 200 metres in 25 seconds.

(a) What is her average speed?

$$\frac{200}{25} = 8$$

..... 8 ..... m/s  
(2)

Bonnie runs at an average speed 4 metres per second for 240 seconds.

(b) How many metres does Bonnie run?

$$4 \times 240$$

..... 960 ..... m  
(2)

(Total for Question 19 is 4 marks)

20 Dermot bakes 420 cakes.  
He bakes only vanilla cakes, banana cakes and lemon cakes.  
120 of the cakes are vanilla cakes.  
35% of the cakes are banana cakes.

Work out the number of lemon cakes Dermot bakes.

$$10\% \text{ of } 420 = \frac{420}{10} = 42$$

$$5\% \text{ of } 420 = \frac{42}{2} = 21$$

$$\begin{aligned} 35\% \text{ of } 420 &= 3(42) + 21 \\ &= 126 + 21 \\ &= 147 \end{aligned}$$

$$420 - 120 = 300$$

$$300 - 147 = 153$$

..... 153 .....

(Total for Question 20 is 3 marks)

21 Zoe wants to buy 6 tins of beans for the cheapest possible price.

Shop A and Shop B both have a special offer.

**Shop A**

5% off the normal price of 48p

**Shop B**

65p each  
Buy 2 get 1 free

Which shop should Zoe buy the beans from?  
You must show how you get your answer.

$$\begin{array}{r} 48 \\ \times 6 \\ \hline 288 \text{ p} \end{array}$$

10% of 288 = 28.8 p  
5% of 288 = 14.4 p

$$\begin{array}{r} 288.0 \\ -14.4 \\ \hline 273.6 \end{array}$$

274p

$$4 \times 65 = 260 \text{ p}$$

Shop B is cheaper

(Total for Question 21 is 3 marks)

22 Work out the value of  $\frac{2^9 \times 2^{-2}}{2^4}$

$$\frac{2^7}{2^4} = 2^3$$

..... 8

(Total for Question 22 is 2 marks)

23 (a) Write down the value of  $2^0$

..... 1 ..... (1)

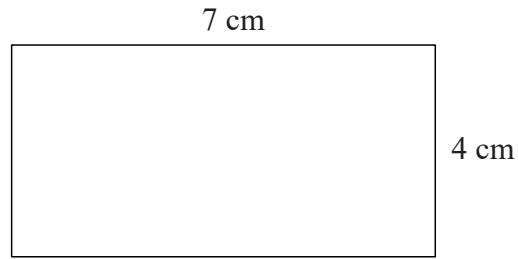
(b) Work out the value of  $(2^2)^3$

$$4^3 = 4 \times 4 \times 4$$

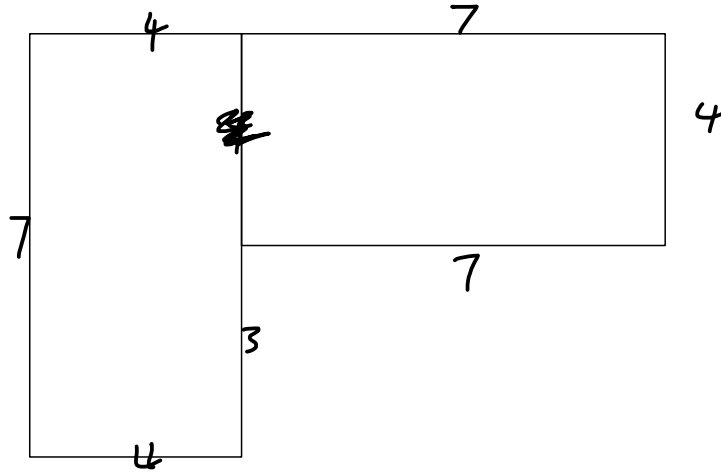
..... 64 ..... (1)

(Total for Question 23 is 2 marks)

24 Here is a rectangle.



The six-sided shape below is made from two of these rectangles.



Work out the perimeter of this six-sided shape.

$$\begin{aligned} &3(7) + 3(4) + 3 \\ &21 + 12 + 3 \\ &33 + 3 \end{aligned}$$

..... 36 ..... cm

(Total for Question 24 is 3 marks)

25 Harry and Gary have a total of 300 stickers.  
The ratio of the number of stickers Harry has to the ratio of the number of stickers Gary has is in the ratio 7 : 3

Harry gives Gary some stickers.

The ratio of the number of stickers Harry has to the ratio of the number of stickers Gary has is now in the ratio 8 : 7

Work out how many stickers Harry gives to Gary.  
You must show all your working.

$$\frac{300}{10} = 30 \quad \begin{array}{c} H \\ 7 \times 30 = 210 \end{array} \quad \begin{array}{c} G \\ 3 \times 30 = 90 \end{array}$$

$$\frac{300}{15} = 20 \quad \begin{array}{c} H \\ 8 \times 20 = 160 \end{array} \quad \begin{array}{c} G \\ 7 \times 20 = 140 \end{array}$$

$$210 - 160 = \underline{\underline{50}}$$

50

(Total for Question 25 is 4 marks)

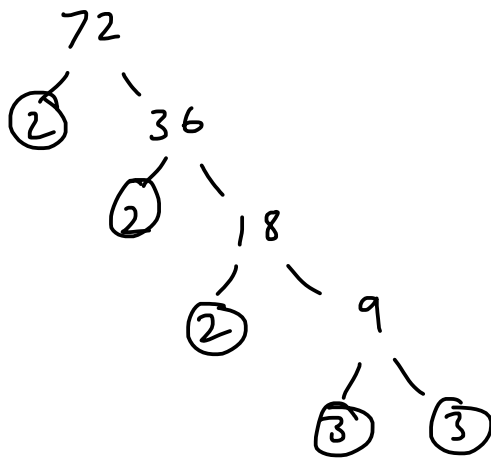
26 Work out  $37.1 \times 9.3$

$$\begin{array}{r} 371 \\ \times 93 \\ \hline 1113 \\ 33390 \\ \hline 34503 \end{array}$$

345.03

(Total for Question 26 is 2 marks)

27 Write 72 as a product of its prime factors.



$2 \times 2 \times 2 \times 3 \times 3$

(Total for Question 27 is 2 marks)

28 Sam is ordering pizza for all the people in her company.

Sam takes a sample of ~~50~~ people in the company.  
She asks them which pizza they would like to order.

The table shows information about the results.

Pizza	Number of People
Margarita	19
Vegetable	13
Pineapple	<u>8</u>
Pepperoni	10

There are 600 people in the company

(a) Work out how many Pineapple pizzas Sam should order

$$\frac{8}{50} = \frac{96}{600}$$

$\frac{600}{50} = 12$

96

(2)

(b) Write down any assumption you made and explain how this could affect your answer.

The people in the sample are representative of all the people in the company. If not Sam may order too many / too few pineapple pizzas

(1)

(Total for Question 28 is 3 marks)

- 29 In a bag there are blue sweets, red sweets and green sweets.  
The ratio of blue sweets to red sweets to green sweets is 5:3:2

What fraction of the sweets are green?

10 parts

$$\frac{2}{10}$$

(Total for Question 29 is 2 marks)

- 30 (a) Work out  $\frac{5 \times 3}{5 \times 4} - \frac{7 \times 2}{10 \times 2}$

$$\frac{15}{20} - \frac{14}{20} = \frac{1}{20}$$

$$\frac{1}{20}$$

(2)

- (b) Work out  $2\frac{1}{3} \times \frac{3}{5}$

Give your answer as a mixed number in its simplest form.

$$\frac{7}{3} \times \frac{3}{5} = \frac{7}{5} = 1\frac{2}{5}$$

$$1\frac{2}{5}$$

(2)

(Total for Question 30 is 4 marks)



- 31 A block exerts a force of 84 Newtons on a table.  
The pressure on the table is  $112 \text{ N/m}^2$ .

Work out the area of the box that is in contact with the table.

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

$$\text{area} = \frac{\text{force}}{\text{pressure}}$$

$$= \frac{84}{112} = \frac{42}{56} = \frac{21}{28} = \frac{3}{4}$$

.....  $0.75$  .....  $\text{m}^2$   
(Total for Question 31 is 2 marks)

- 32 Andy and Bruce share some sweets in the ratio 9:4.  
Andy gets  $A$  sweets  
Bruce gets  $B$  sweets

13 parts  $\times 7$

Carla and David share the same amount of sweets as Andy and Bruce.  
They share their sweets in the ratio 5:2.

7 parts  $\times 13$

Carla gets  $C$  sweets  
David gets  $D$  sweets

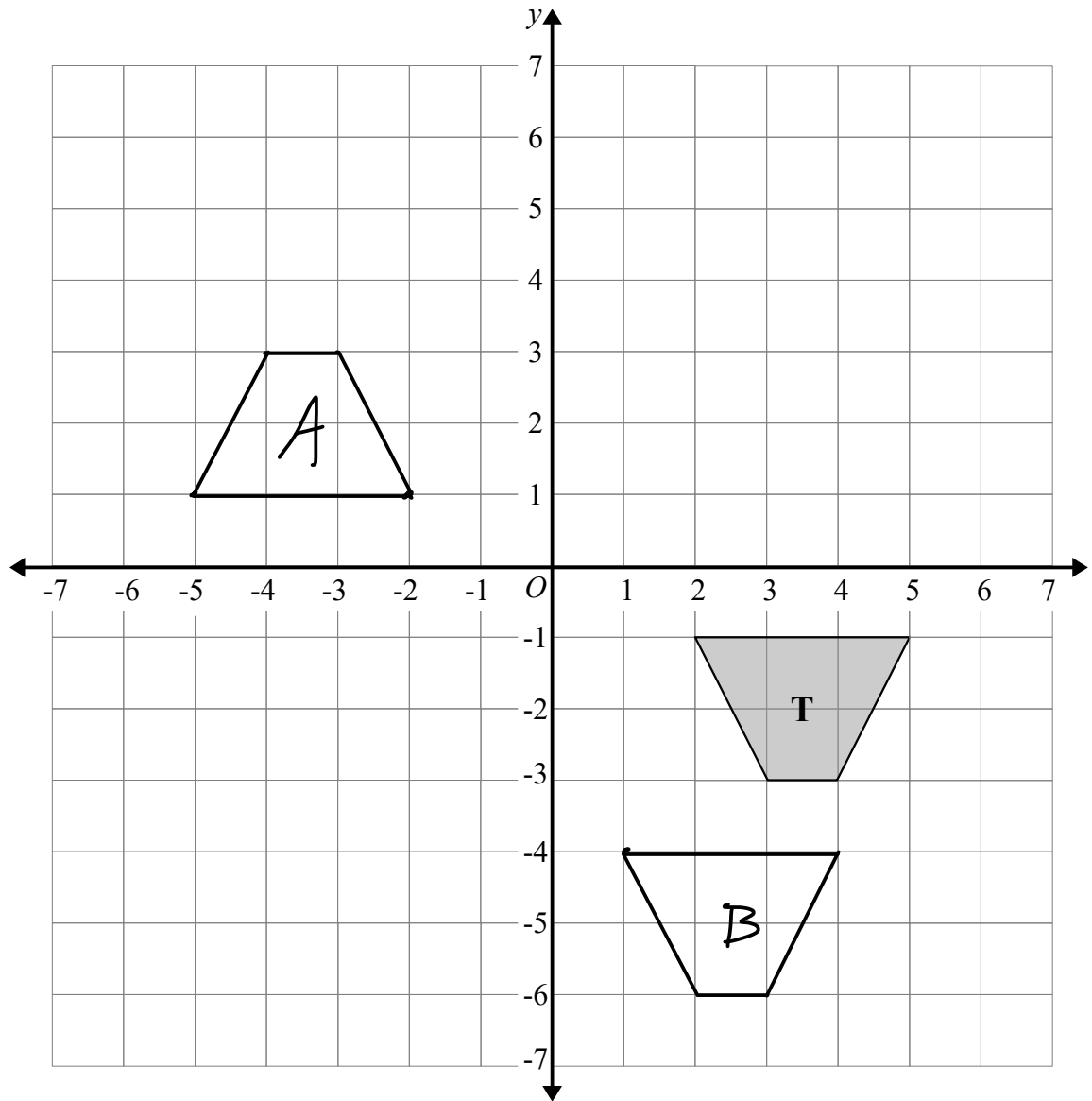
Find  $A:B:C:D$

$$\begin{array}{l} A : B \\ 9 : 4 \\ 63 : 28 \end{array}$$

$$\begin{array}{l} C : D \\ 5 : 2 \\ 65 : 26 \end{array}$$

.....  $63:28:65:26$  .....

(Total for Question 32 is 3 marks)



(a) Rotate trapezium **T**  $180^\circ$  about the origin.  
Label the new trapezium **A**.

(b) Translate trapezium **T** by the vector  $\begin{pmatrix} -1 \\ -3 \end{pmatrix}$   
Label the new trapezium **B**.

(Total for Question 33 is 2 marks)

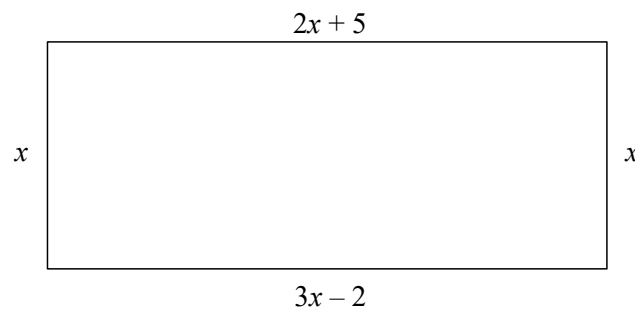
34 Factorise  $x^2 + 11x - 42$

$$(x + 14)(x - 3)$$

$$(x + 14)(x - 3)$$

(Total for Question 34 is 2 marks)

35 The diagram shows a rectangle.  
All measurements are in centimetres.



Find the perimeter of the rectangle.

$$2x + 5 = 3x - 2$$

$$5 = x - 2$$

$$x = 7$$

$$3(7) - 2 = 19$$

$$2(19) + 2(7)$$

$$38 + 14$$

$$52$$

..... cm

(Total for Question 35 is 3 marks)