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MATHEMATICS

0580/32

Paper 3 (Core)

October/November 2020

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

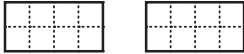
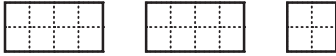



- The total mark for this paper is 104.
- The number of marks for each question or part question is shown in brackets [].

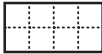
This document has **16** pages. Blank pages are indicated.



1 George, Louis and Beatriz have a café.

- (a) George records the number of each type of meal sold.
He draws a pictogram to show his results.
All rows are complete except for Salad.

Type of meal	Number of meals
Meat curry	
Pasta	
Vegetarian	
Salad	
Fish	
Sandwich	

Key:  = 8 meals

- (i) Six salads were sold.

Complete the pictogram. [1]

- (ii) Write down which type of meal was sold most.

..... [1]

- (iii) Find the number of meals sold altogether.

..... [1]

(b) The café also sells drinks.

Drinks	
Cup of tea	\$2.20
Cup of coffee	\$2.80
Bottle of juice	\$1.50
Bottle of water	\$1.35

Johan buys 2 cups of tea, 1 bottle of juice and 1 bottle of water.

Calculate the change he receives from a \$10 note.

\$ [2]

- (c) These are the opening times of the café.

Monday to Friday	8 am to 6 pm
Saturday	9.30 am to 3 pm
Sunday	Closed

Work out the total number of hours the café is open in one week.

..... hours [2]

- (d) One week the café makes a profit of \$1027.
George, Louis and Beatriz share this profit in the ratio George : Louis : Beatriz = 7 : 4 : 2.

Calculate the amount of money they each receive.

George \$

Louis \$

Beatriz \$ [3]

- (e) In 2019 the rent for the café was \$7275.
In 2020 the rent is \$7566.

Calculate the percentage increase in the rent.

.....% [2]

- (f) George drives 315 km from the café to the airport.
The journey takes 3 hours 30 minutes.

Calculate his average speed.

..... km/h [1]

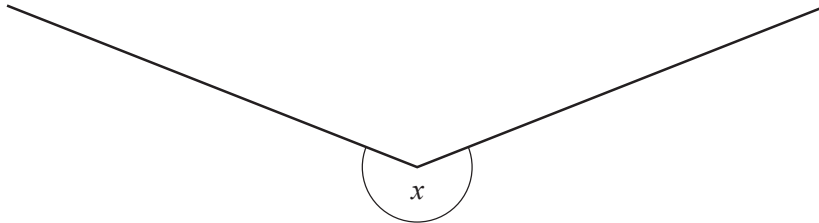
2 (a)



Measure the length of this line in millimetres.

..... mm [1]

(b)



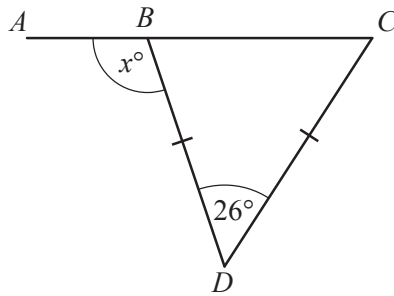
(i) Measure the size of angle x .

..... [1]

(ii) Write down the mathematical name of this type of angle.

..... [1]

(c)



NOT TO SCALE

ABC is a straight line and BCD is an isosceles triangle.

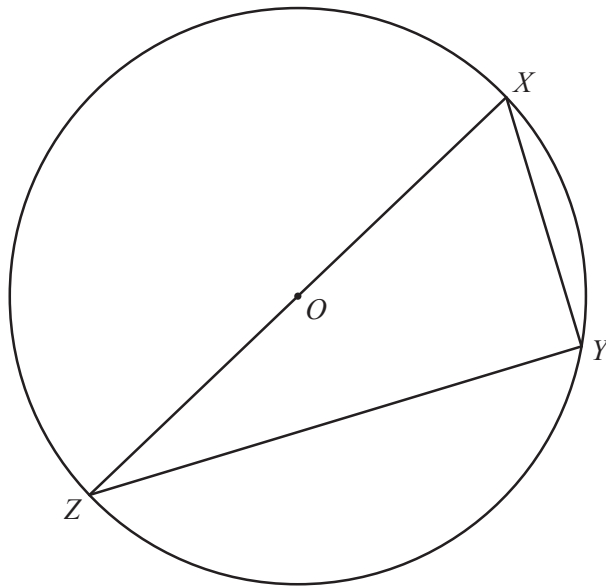
Find the value of x .

$x =$ [2]

(d) Work out the size of one interior angle of a regular 16-sided polygon.

..... [2]

(e)



NOT TO SCALE

(i) Complete this statement.

X , Y and Z are points on the of the circle, centre O . [1]

(ii) Give a reason why angle XYZ is 90° .

..... [1]

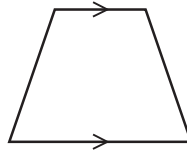
(f) A circle has diameter 6 cm.

Calculate the area of the circle.
Give the units of your answer.

..... [3]

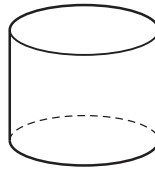
3 (a) Write down the mathematical name for this

(i) quadrilateral,



..... [1]

(ii) solid.



..... [1]

(b) The area of a square is 64 cm^2 .

Work out the length of one side of the square.

..... cm [1]

(c) The length, l , of a rectangle is 3 cm longer than the width, w .
The perimeter of the rectangle is 26 cm.

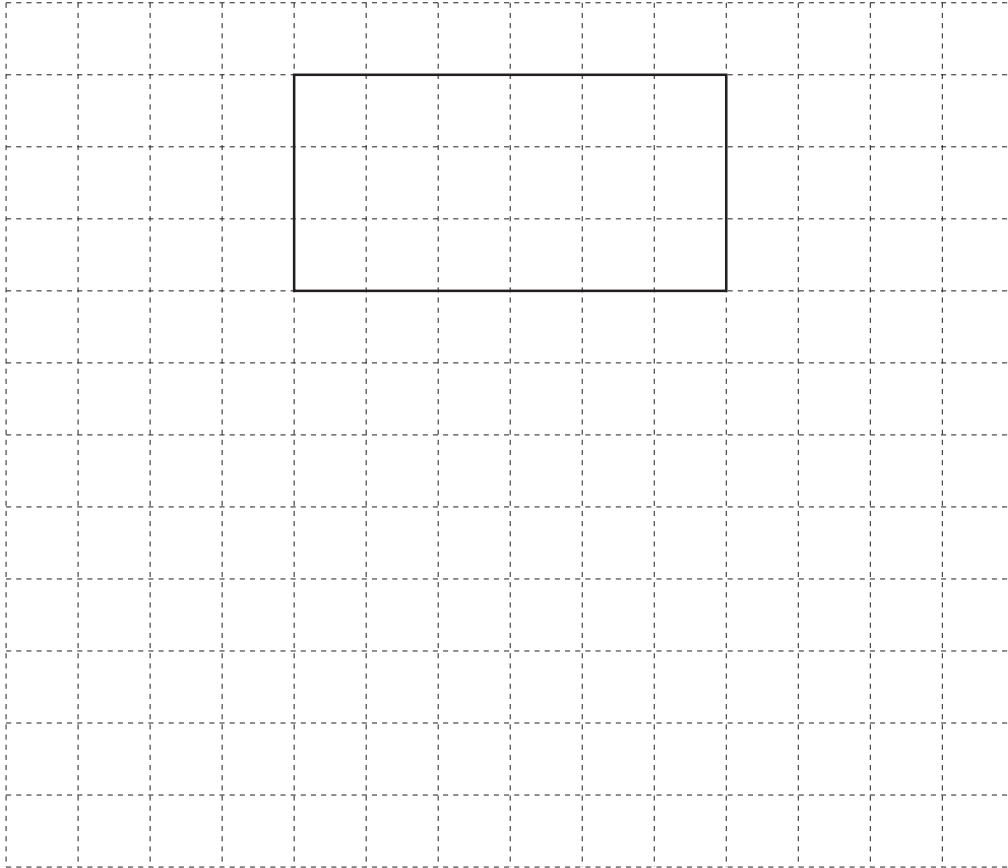
Calculate the length, l , and the width, w .

$l =$ cm

$w =$ cm [3]

(d) A cuboid measures 6 cm by 3 cm by 1 cm.

- (i) On the 1 cm^2 grid, draw an accurate net of this cuboid.
One face has been drawn for you.



[3]

- (ii) Calculate the surface area of the cuboid.

..... cm^2 [2]

- 4 (a) Sami travels to work by bus.
The bus leaves the bus station at 0735.

- (i) It takes Sami 23 minutes to walk from his house to the bus station.

Work out the latest time Sami can leave his house.

..... [1]

- (ii) The bus journey takes 41 minutes.

Work out the arrival time of the bus.

..... [1]

- (b) The scale drawing shows the positions of two towns, *A* and *B*.
The scale is 1 centimetre represents 10 kilometres.



Scale : 1 cm to 10 km

- (i) Work out the actual distance between town *A* and town *B*.

..... km [2]

- (ii) Town *C* is 85 km from town *A* on a bearing of 100° .

On the scale drawing, mark the position of town *C*.

[2]

5 (a) Here are the weekly wages, in dollars, of the ten workers in an office.

280 200 175 1180 95 182 238 256 194 250

(i) Find the median.

\$ [2]

(ii) Calculate the mean.

\$ [2]

(iii) For this office, explain why the mean is not a suitable average.

..... [1]

(b) The stem-and-leaf diagram shows the ages of the workers in a factory.

1	6	7	7	9		
2	2	3	4	6	8	
3	0	2	3	6	9	
4	1	4	4	8		
5	0	1	6	6	6	9
6	1	5	8			

Key : 2|3 represents 23

(i) Write down the mode.

..... [1]

(ii) Work out the range.

..... [1]

6 (a) Write 60 025 in words.

..... [1]

(b) Write 849.481 correct to 1 decimal place.

..... [1]

(c) Write down

(i) all the factors of 21,

..... [2]

(ii) a prime number between 40 and 50.

..... [1]

(d) Write $\frac{2}{5}$ as a decimal.

..... [1]

(e) Find the value of

(i) $\sqrt[3]{2744}$,

..... [1]

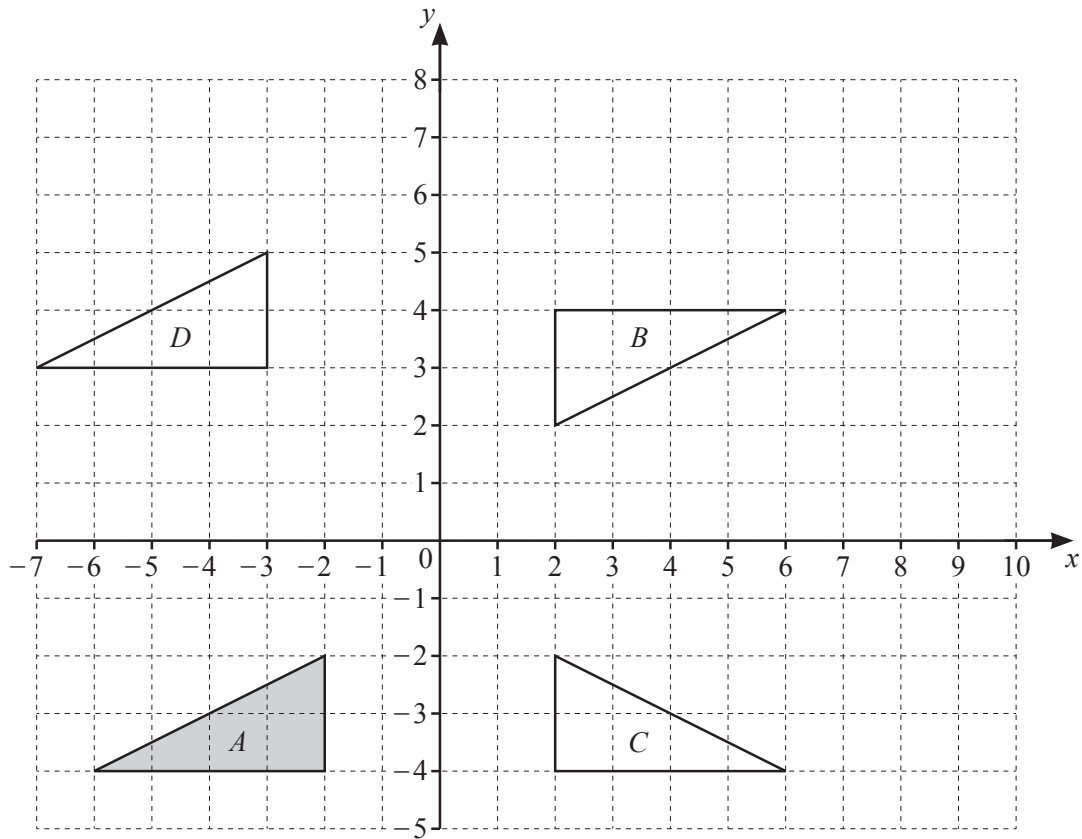
(ii) 7^0 .

..... [1]

(f) Gino invests \$6000 for 5 years at a rate of 1.2% per year compound interest.

Calculate the value of his investment at the end of the 5 years.
Give your answer correct to the nearest dollar.

\$ [3]



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

(i) triangle *A* onto triangle *B*,

.....
 [3]

(ii) triangle *A* onto triangle *C*,

.....
 [2]

(iii) triangle *A* onto triangle *D*.

.....
 [2]

(b) On the grid, enlarge triangle *A* by scale factor 0.5, centre (4, 0). [2]

8 (a)

COMMONWEALTH

Lindon picks a letter at random from this word.

Explain why the probability that he picks a letter **M** is not $\frac{1}{10}$.

..... [1]

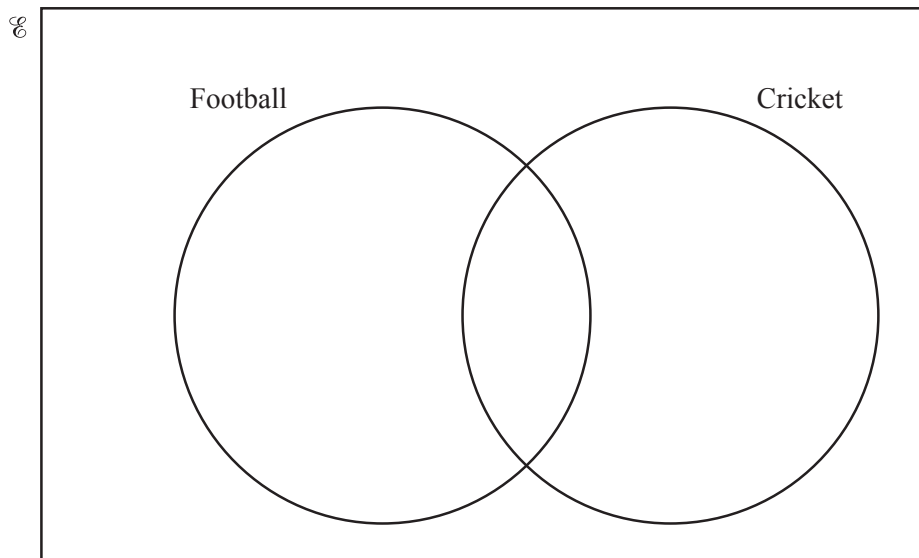
- (b) Tickets for athletics or swimming or hockey or diving are placed in a box. A ticket is picked at random from the box.

Sport	Athletics	Swimming	Hockey	Diving
Probability	0.12		0.09	0.4

Complete the table. [2]

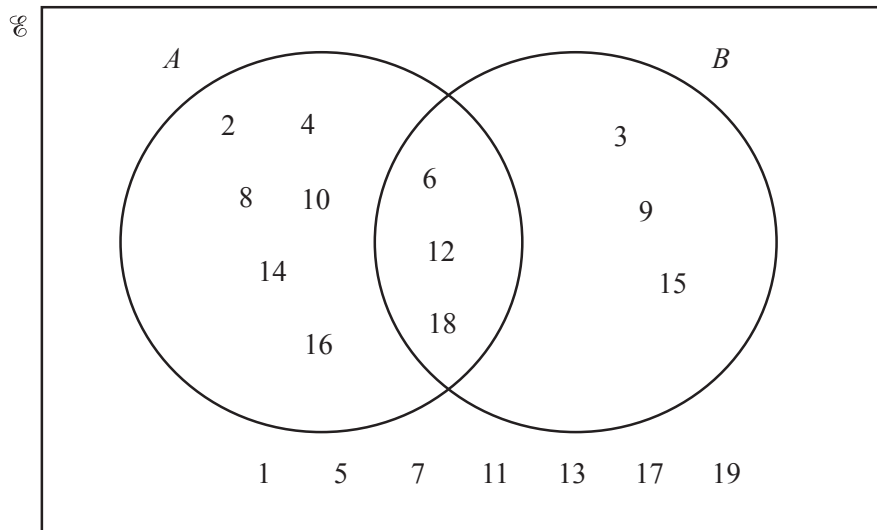
- (c) In a group of 40 students,

- 24 students like football
- 19 students like cricket
- 10 students like football but not cricket.



Complete the Venn diagram. [3]

- (d) $\mathcal{U} = \{x : x \text{ is a positive integer less than } 20\}$
 $A = \{x : x \text{ is an even number}\}$
 $B = \{x : x \text{ is a multiple of } 3\}$



- (i) Write down $n(A)$.

..... [1]

- (ii) List the elements of set B .

$B = \{ \dots \}$ [2]

- (iii) One of these 19 numbers is picked at random.

Work out the probability that this number is

- (a) not in set A and not in set B ,

..... [1]

- (b) in $A \cup B$.

..... [1]

- (iv) Complete the statement.

$A \cap B = \{x : x \text{ is } \dots \}$ [1]

9 (a) Simplify.

$$4x + 3y + 2x - 8y$$

..... [2]

(b) A pen costs 60 cents and a ruler costs 29 cents.

Write down an expression for the total cost, in cents, of x pens and y rulers.

..... cents [2]

(c) Solve.

$$5(2x + 4) = 85$$

$x =$ [3]

(d) (i) $2^8 \times 2^m = 2^6$

Work out the value of m .

$m =$ [1]

(ii) $5^n \div 5^4 = 5^6$

Work out the value of n .

$n =$ [1]

15

- (e) A plant costs p dollars and a bush costs b dollars.
Ana buys 2 plants and 4 bushes for \$42.
Paola buys 7 plants and 9 bushes for \$107.

Write down a pair of simultaneous equations and solve them to find the value of p and the value of b .

You must show all your working.

$$p = \dots\dots\dots$$

$$b = \dots\dots\dots [6]$$

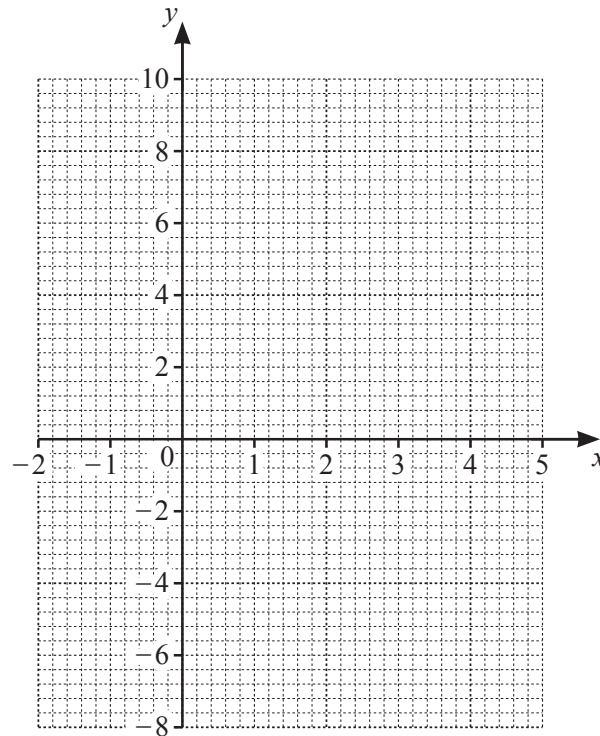
Question 10 is printed on the next page.

10 (a) Complete the table of values for $y = x^2 - 4x - 3$.

x	-2	-1	0	1	2	3	4	5
y		2	-3	-6		-6	-3	2

[2]

(b) On the grid, draw the graph of $y = x^2 - 4x - 3$ for $-2 \leq x \leq 5$.



[4]

(c) Use your graph to solve the equation $x^2 - 4x - 3 = 0$.

$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [2]

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