



EPSOM

COLLEGE

MATHEMATICS

SPECIMEN PAPER

FOR CANDIDATES APPLYING TO YEAR 9 OR YEAR 10

TIME ALLOWED: ONE HOUR 30 MINUTES

Write your answers on the question paper in the spaces provided.

Calculators may be used but you must show all of your working or you may not be awarded marks.

You should attempt all the questions.

Q1.

(a) Simplify $5x + 4y + x - 7y$

.....
(2)

(b) Solve $7(x + 2) = 7$

.....
(2)

(Total for Question is 4 marks)

Q2. You must show full working in this question

(a) Work out $\frac{1}{7} \times \frac{2}{3}$

.....
(1)

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

.....
(2)

(Total for Question is 3 marks)

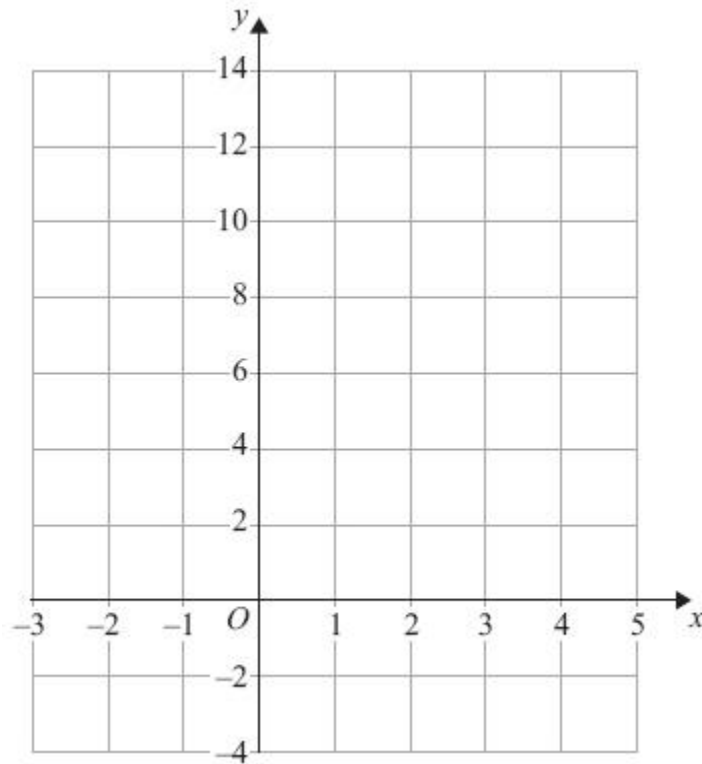
Q3.

(a) Complete the table of values for $y = 2x + 2$

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

(2)

(b) On the grid, draw the graph of $y = 2x + 2$



(2)

(Total for Question is 4 marks)

Q4.

Here is the number of goals a hockey team scored in each of 10 matches.

3 4 3 2 5 3 5 6 2 4

Find

(i) the median

.....

(ii) the range

.....

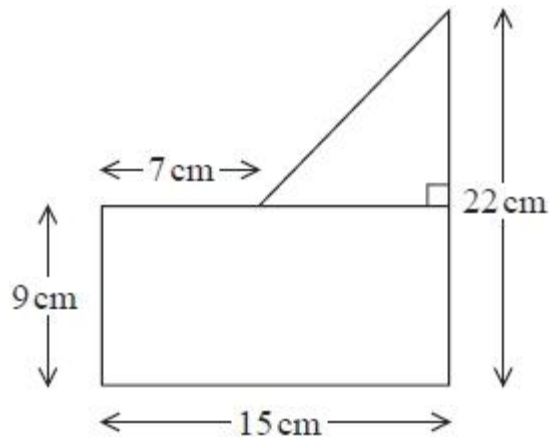
(iii) the mean

.....

(Total for Question is 6 marks)

Q5.

Here is a shape made from a rectangle and a triangle.



Work out the total area of the shape.

..... cm²

(Total for question = 3 marks)

Q6.

Expand and simplify $5(p + 3) - 2(1 - 2p)$

.....

(Total for question = 2 marks)

Q7.

A set of tyres normally costs £500
In a sale there is a 30% discount.

Work out the sale price of the set of tyres.

£.....

(Total for Question is 3 marks)

Q8.

(a) Solve $3(2p - 5) = 21$

$p = \dots\dots\dots$
(3)

(b) Solve $9x - 11 = 5x + 7$

$x = \dots\dots\dots$
(3)

(Total for Question is 6 marks)

Q9.

A shop sells packets of envelopes.

There are 5 envelopes in a small packet.

There are 20 envelopes in a large packet.

There is a total of T envelopes in x small packets and y large packets.

Write down a formula for T in terms of x and y .

.....
(Total for question = 3 marks)

Q10.

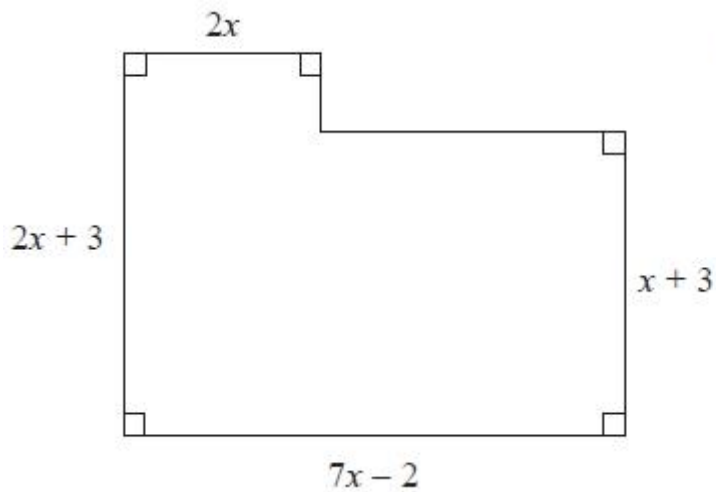


Diagram NOT
accurately drawn

All the measurements in the diagram are in centimetres.

The area of the shape is $A \text{ cm}^2$.

Find a formula for A in terms of x .

You must write your formula as simply as possible.

.....
(Total for question = 4 marks)

Q11.

Julie is x years old.
Kevin is $x + 3$ years old.
Omar is $2x$ years old.

Write an expression, in terms of x , for the mean of their ages.

.....
(Total for Question is 2 marks)

Q12.

(a) Expand and simplify $7a + 4(a - 2b)$

.....
(2)

(b) Simplify $n^6 \times n^5$

.....
(1)

(c) Factorise $5x + 10$

.....
(1)

(Total for question = 4 marks)

Q13.

Ben and Lago have some identical packets.

Ben has 20 of the packets.

The total weight of Ben's packets is 32 kg.

Lago has 25 of the packets.

Work out the total weight of Lago's packets.

..... kg

(Total for question = 2 marks)

Q14.

Tom and Amy set the alarms on their phones to sound at 6.45 am.

Both alarms sound together at 6.45 am.

Tom's alarm then sounds every 9 minutes.

Amy's alarm then sounds every 12 minutes.

At what time will both alarms next sound together?

.....

(Total for question = 3 marks)

Q15.

Emily buys a pack of 12 bottles of water.
The pack costs £5.64

Emily sells all 12 bottles for 50p each.

Work out Emily's percentage profit.
Give your answer correct to 1 decimal place.

..... %

(Total for question = 3 marks)

Q16.

The Kumar family are going to go to New York.

They will go with Highway Airlines or Jetstream Airlines.

The tables show how much it costs for each adult and each child to go with these airlines.

Highway Airlines

Date	Adult	Child
4 – 10 July	£475	£280
11 – 17 July	£488	£282
18 – 24 July	£516	£304
25 – 31 July	£506	£297
1 – 7 August	£462	£251
8 – 14 August	£430	£238
15 – 21 August	£421	£235
22 – 28 August	£399	£221

Jetstream Airlines

Date	Adult	Child
4 – 10 July	£483	£286
11 – 17 July	£493	£296
18 – 24 July	£526	£315
25 – 31 July	£519	£303
1 – 7 August	£485	£218
8 – 14 August	£429	£245
15 – 21 August	£409	£232
22 – 28 August	£401	£222

Highway Airlines give a discount of 5% of the total cost for booking online.

Jetstream Airlines give a discount of £25 per person for booking online.

The Kumar family are going to New York on 3 August.

They will buy 2 adult tickets and 1 child ticket.

They will book online.

The Kumar family want to pay the lower total cost.

Which airline should they choose?

(Total for Question is 5 marks)

Q17.

There are 15 children at a birthday party.
The mean age of the 15 children is 7 years.

9 of the 15 children are boys.
The mean age of the boys is 5 years.

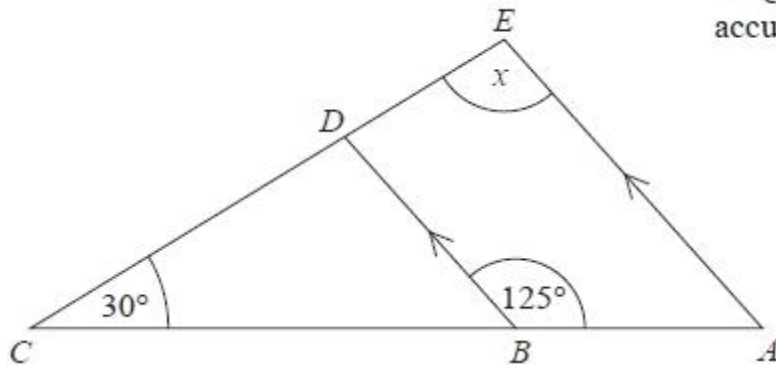
Work out the mean age of the girls.

..... years

(Total for question = 3 marks)

Q18.

Diagram NOT
accurately drawn



ABC and EDC are straight lines.

AE and BD are parallel.

Angle $ABD = 125^\circ$

Angle $BCD = 30^\circ$

Work out the size of the angle marked x .

Give reasons for your answer.

(Total for question = 4 marks)

Q19.

The diagram shows a trapezium.

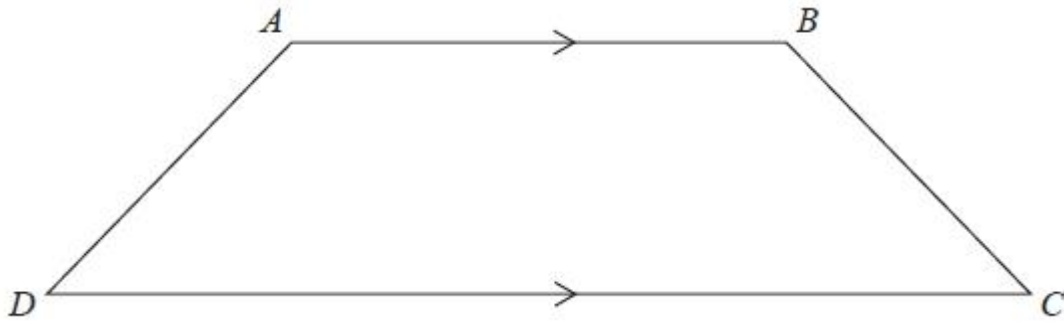


Diagram **NOT** accurately drawn

$AD = x$ cm.

BC is the same length as AD .

AB is twice the length of AD .

DC is 4 cm longer than AB .

The perimeter of the trapezium is 38 cm.

Work out the length of AD .

.....cm

(Total for Question is 4 marks)

Q20.

(a) Write 3500 ml in litres.

..... litres
(1)

(b) Write 3 kilograms in grams

..... grams
(1)

(c) Change 3 m² to cm².

..... cm²
(2)

(Total for question = 4 marks)

Q21.

The body mass index, B , for a person of mass m kg and height h metres is given by the formula

$$B = \frac{m}{h^2}$$

Usman has a mass of 50 kg.

He has a height of 1.57 m.

(a) Work out Usman's body mass index.

Give your answer correct to one decimal place.

.....
(2)

Tom's height is 1.80 m.

He wants his body mass index to be 21

(b) Work out the mass that will give Tom a body mass index of 21

..... kg
(2)

Tom is a ski jumper.

The maximum length of skis he can use is 145% of his height.

Tom's height is 1.80 m.

(c) Work out the maximum length of skis Tom can use.

..... m
(3)

(Total for question = 7 marks)