THE ENGLISH SCHOOL

MID PROGRAM ENTRY INTO YEAR 2

MATHEMATICS **SATURDAY 30TH MAY 2020**

Time allowed 2 hours

Instructions to Candidates

Answer the questions in the spaces provided.

Without sufficient working, correct answers may be awarded no marks.

TOTAL MARKS

Information for Candidates

This paper has 40 questions.

There are 20 pages in this question paper.

Full marks may be obtained for answers to all questions.

The total marks for this paper is 120.

The marks for each question is shown in round brackets, e.g. (2)

Calculators are not allowed.

Advice to Candidates

Write your answers neatly and in good English.

Work steadily through the paper.

Do not spend too long on one question.

Show all stages in any calculations.

Materials required for the paper

Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

Tracing paper may be used.

1. Round the following numbers to the specified accuracy:

Number	Nearest whole number	2 decimal places	Nearest thousand	1 Significant figure
2 394. 0909				
0. 9099				

(Total 4 marks)

---

2. Calculate the following, showing clearly all your workings:

(a) $-6 \div (-2) - 1$

.....

(1)

(b) $(-3+4)^2 \times (4-11)^2$

.....

(1)

(c) $6 - 2 \times 3$

.....

(1)

(Total 3 marks)

---

3. Write the following fractions in order of size.
Start with the smallest fraction.

$$\frac{1}{3} \qquad \frac{3}{4} \qquad \frac{1}{4} \qquad \frac{7}{12} \qquad \frac{1}{2}$$

.....

(Total 2 marks)

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4. (a) Work out $\frac{2}{3} - \frac{1}{5}$

.....

(2)

(b) Work out $\frac{3}{4} \times \frac{5}{9}$. Give your answer as a fraction in its simplest form.

.....

(2)

(c) Work out $3\frac{1}{2} \times 1\frac{3}{5}$. Give your answer as a mixed number in its simplest form.

.....

(2)
(Total 6 marks)

---

5. Ali, Ben and Cathy share an amount of money in the ratio 6 : 9 : 10

What fraction of the money does Ben get?

.....

(Total 2 marks)

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6. Find the Lowest Common Multiple (LCM) of 108 and 120

.....

(Total 3 marks)

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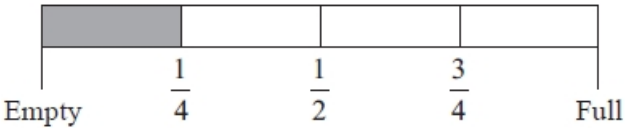
7. Here is the gauge for the fuel tank of a car.



The fuel tank holds 52 litres when is full.

How many litres of fuel are needed to fill the tank if $\frac{1}{4}$ of the tank is already full?

..... litres

(Total 3 marks)

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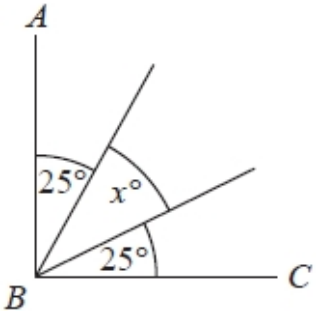
8. *AB* and *BC* are perpendicular lines. Find the value of *x*.



x = ...

(Total 2 marks)

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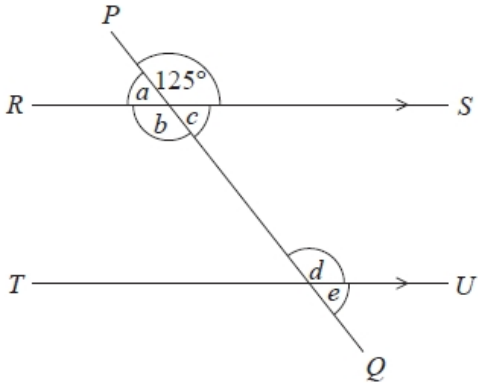
9. *RS* and *TU* are parallel lines. *PQ* is a straight line.



An angle of size 125° is shown on the diagram.

(i) Write down the letter of one other angle of size 125° .

Give a reason for your answer.

.....

.....

(2)

(ii) Explain why $a + b + c = 235°$

.....

.....

.....

(1)

(Total 3 marks)

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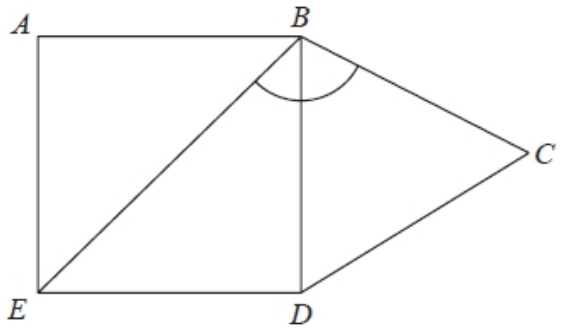
10. The diagram shows a square *ABDE* and an equilateral triangle *BCD*.

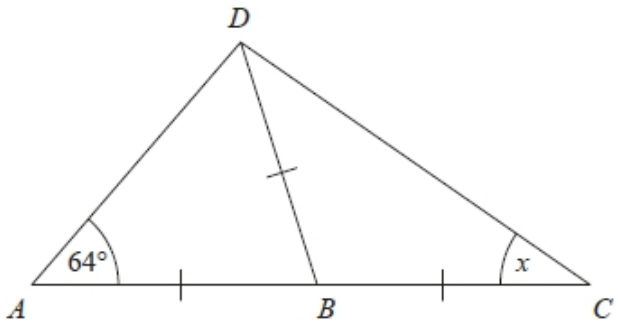


Work out the size of angle *EBC*.

..... °

(Total 2 marks)

11.



ABC is a straight line.
AB = *BC* = *BD*.
Angle *DAB* = 64°

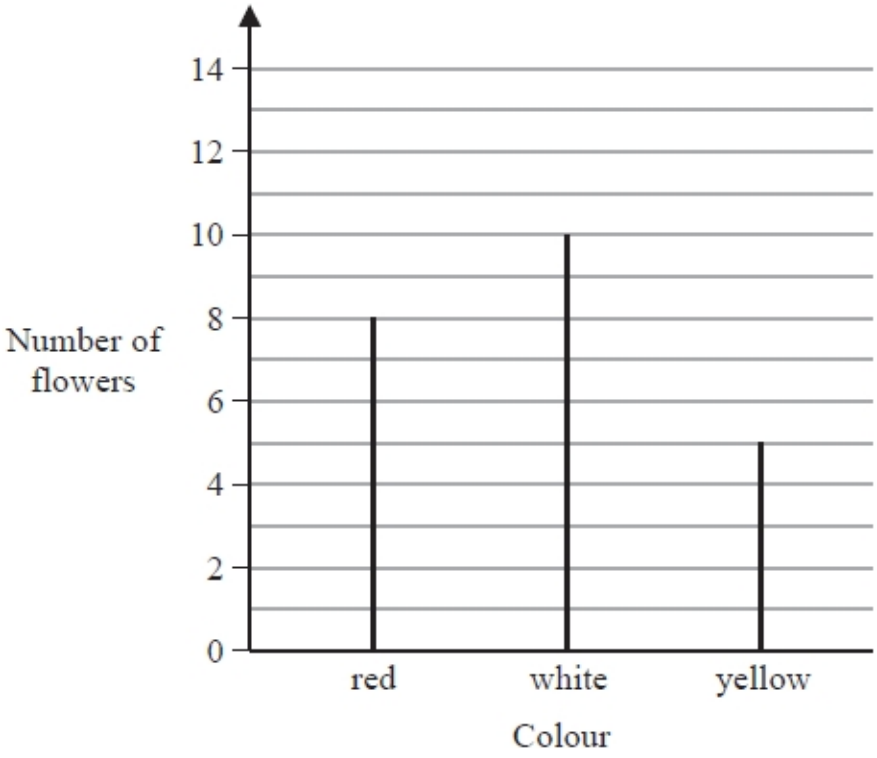
Work out the size of the angle marked *x*.
Give a reason for each stage of your working.

..... °

(Total 4 marks)

12. In Adam's garden, the flowers are only red or white or yellow or blue.

The chart shows the number of red flowers, the number of white flowers and the number of yellow flowers.



The total number of flowers is 30

(a) Work out the number of blue flowers.

.....

(2)

(b) Write down the mode.

.....

(1)

(Total 3 marks)

---

13. Work out 15% of 160 grams.

..... grams

(Total 2 marks)

---

14. Here are the first five terms of a modified Fibonacci sequence.

3 3 6 9 15

Write down the next two terms of the sequence.

..... , ...

(Total 2 marks)

---

15. Four biased coins, A, B, C and D are thrown.

The probability that each coin will land on Heads is shown in the table.

Coin	Probability
A	0.33
B	0.033
C	$\frac{1}{3}$
D	30%

(a) (i) Which coin is least likely to land on Heads?

.....

(1)

(ii) Which coin is most likely to land on Heads?

.....

(1)

Julie says,

"The probability that coin C will land on Heads is the same as the probability that coin C will land on Tails."

(b) Is she correct?
Give a reason for your answer.

.....

.....

.....

(1)

(Total 3 marks)

---

16. Tom and Adam have a total of 240 stamps.
The ratio of the number of Tom's stamps to the number of Adam's stamps is 3 : 7

Tom buys some stamps from Adam.
The ratio of the number of Tom's stamps to the number of Adam's stamps is now 3 : 5

How many stamps does Tom buy from Adam?
You must show all your working.

.....

(Total 4 marks)

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17. $P = 7r + 3q$

Work out the value of P when $r = 5$ and $q = -4$

.....

(Total 2 marks)

---

18. (a) Simplify $a \times b \times 7$

.....

(1)

(b) Simplify $4e + 6f + 7e - f$

.....

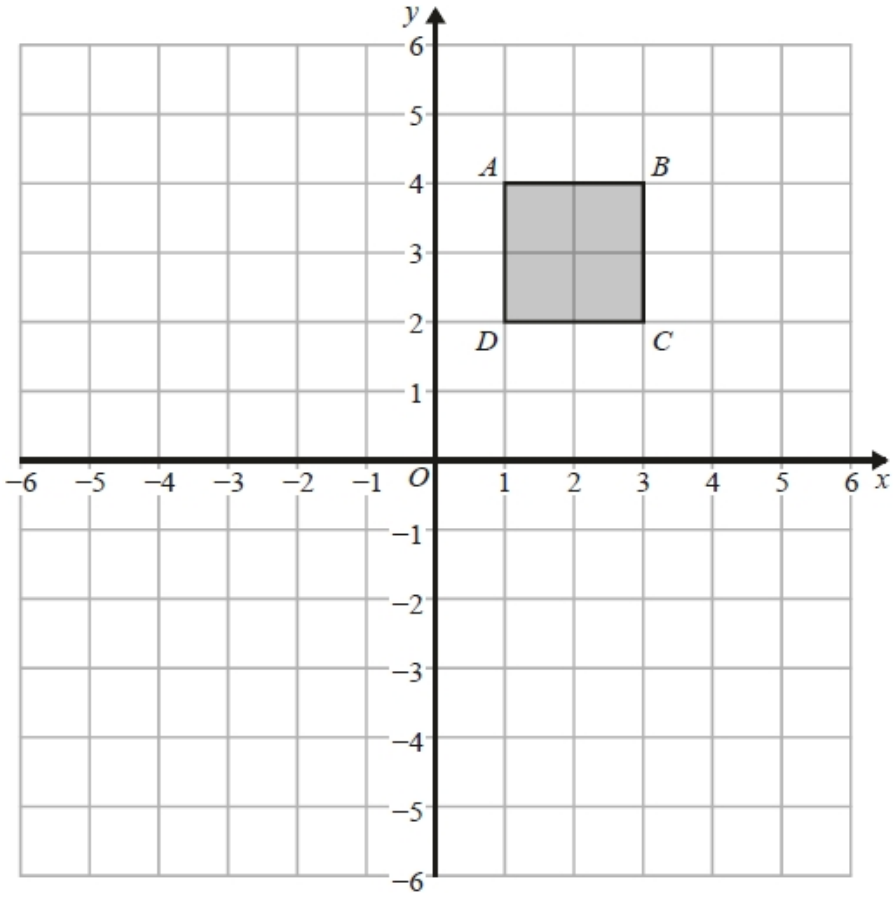
(1)

(c) Simplify $\dfrac{e \times e \times e \times f}{e \times e \times f \times f}$ fully

.....

(2)
(Total 4 marks)

19.



(a) Reflect the shaded square in the line $y = -x$.

(b) On the grid, rotate the square ABCD 90° anticlockwise about (0, 0)
Label the new shape B.

(Total 4 marks)

20. There are 14 rows of seats in a cinema. There are 15 seats in each row.

A film was shown in the cinema on Saturday. Each ticket for the film cost £6.50

The tickets that were sold cost a total of £1274 .How many tickets were **not** sold?

.....

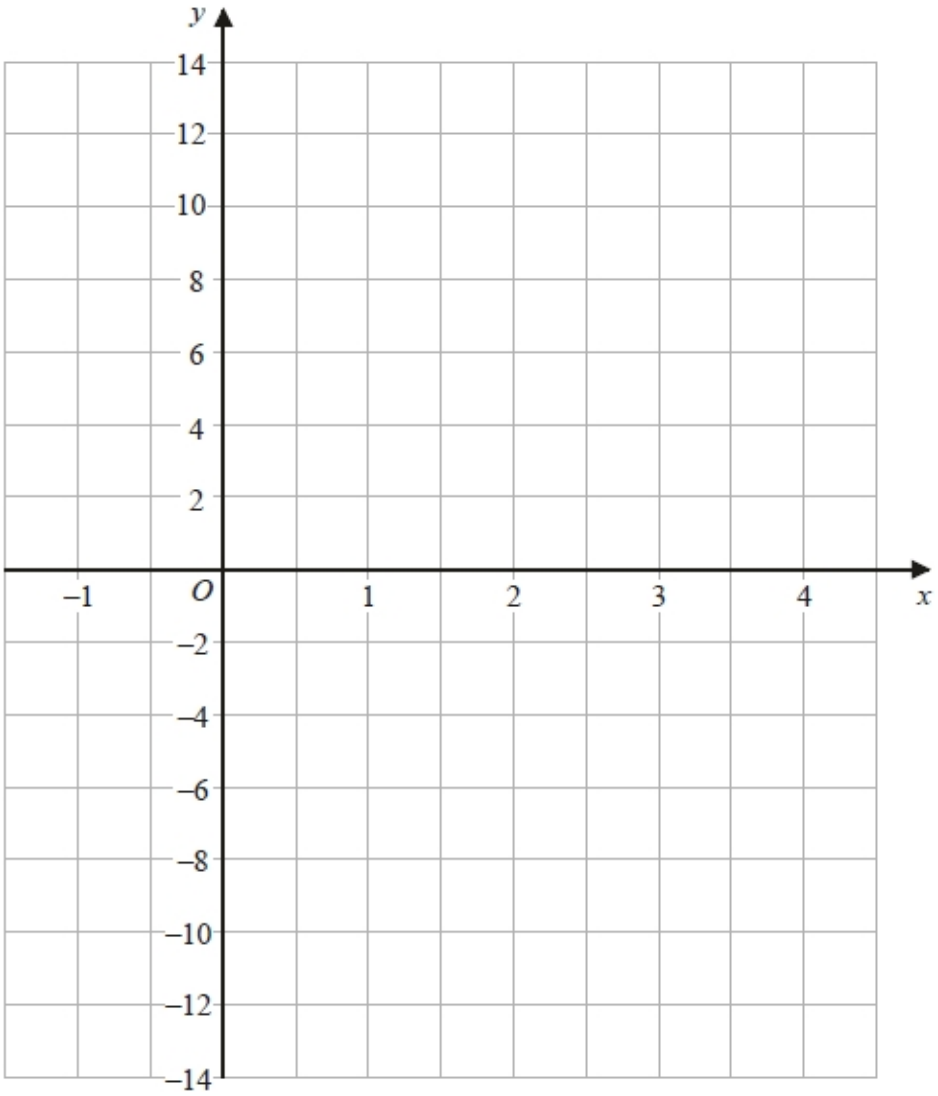
(Total 3 marks)

21. (a) Complete the table of values for $y = 4x - 6$

x	−1	0	1	2	3	4
y			−2			10

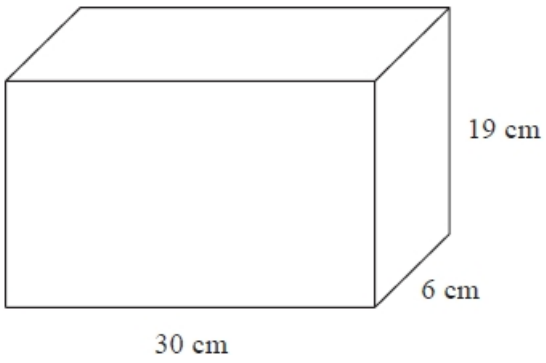
(2)

(b) On the grid, draw the graph of $y = 4x - 6$ for values of x from −1 to 4



(2)
(Total 4 marks)

22. A container is in the shape of a cuboid.



The container is $\frac{2}{3}$ full of water.

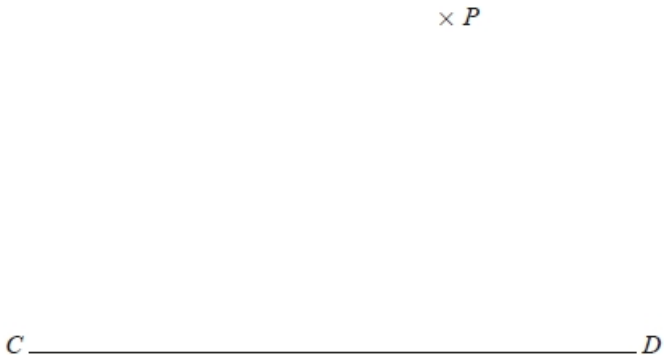
A cup holds 275 ml of water.

What is the greatest number of cups that can be completely filled with water from the container?

.....

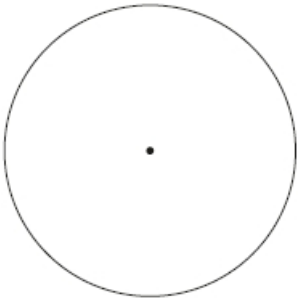
(Total 4 marks)

23. Use a ruler and compasses to construct the line from the point *P* perpendicular to the line *CD*.
You must show **all** construction lines.



(Total 2 marks)

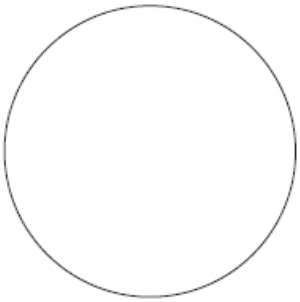
24.



(a) On the diagram above, draw a diameter of the circle.

(1)

(b) On the diagram below, draw a segment of the circle.
Shade the segment.



(1)

(Total 2 marks)

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25. (a) Expand $5(2m - 3)$

.....

(1)

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

.....

(2)
(Total 3 marks)

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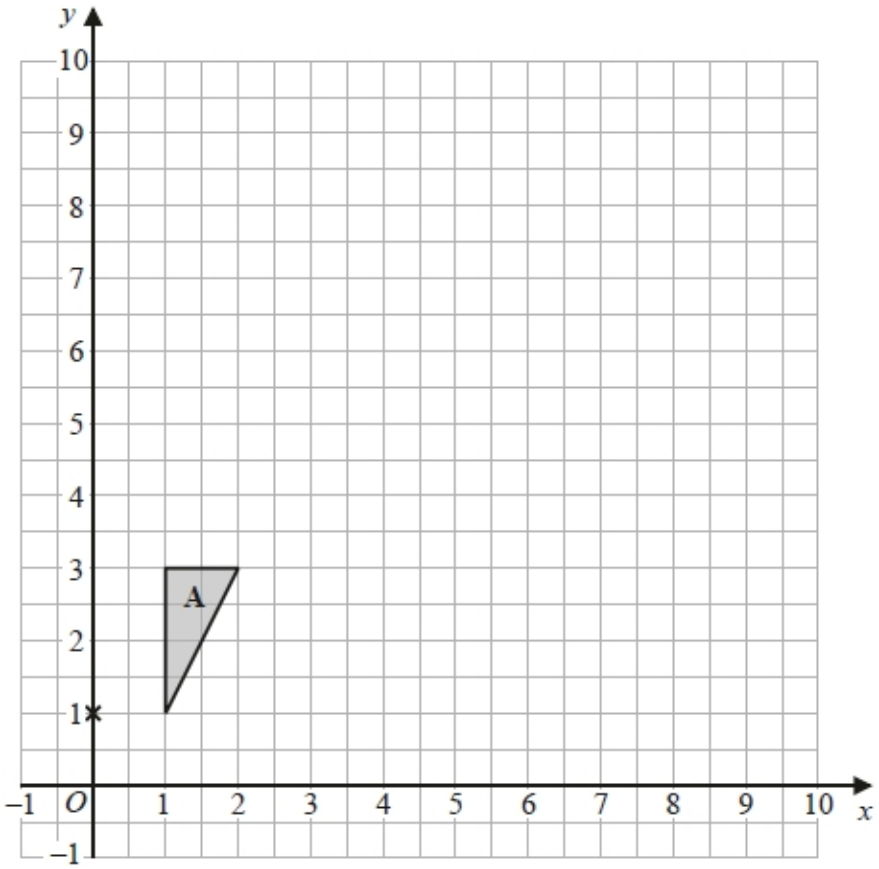
26. Enlarge triangle **A** by scale factor 3 with centre (0, 1)



(Total 2 marks)

27. Bronwin works in a restaurant.

The table gives her rates of pay.

Day	Rate of pay
Monday to Friday	£8.40 per hour
Weekend	£11.20 per hour

Bronwin worked for a total of 20 hours last week.
She worked 8 of these 20 hours at the weekend.

Show that Bronwin was paid less than £200 last week.

(Total 3 marks)

28. (a) Change 15 cm to mm.

..... mm

(1)

(b) Change 370 millilitres to litres.

..... litres

(1)

(c) Change 0.022 kilograms to grams.

..... grams

(1)

(d) Write $\frac{4}{50}$ as a percentage.

..... %

(1)

(Total 4 marks)

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29. Solve $\frac{5-x}{2} = 2x - 7$

x = ...

(Total 3 marks)

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30. $P = 4x + 3y$

$x = 5$
$y = -2$

(a) Work out the value of P.

.....

(2)

(b) Expand $4e(e + 2)$

.....

(2)

(c) Solve $3(m - 4) = 21$

..... m

(2)
(Total 6 marks)

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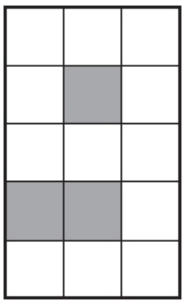
31. A pattern is made with white squares and shaded squares

Shade **one** more square to make a pattern with rotational symmetry of order 2



(Total 1 mark)

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32. Renee buys 5 kg of sweets to sell. Renee puts all the sweets into bags.
She puts 250 g of sweets into each bag. She sells each bag of sweets for 65p.

Renee sells all the bags of sweets. How much money she collects?

.....

(Total 2 marks)

33. David has twice as many cousins as Becky. Becky has twice as many cousins as Nishat.

Nishat has 6 cousins. How many cousins does David have?

.....

(Total 2 marks)

34. The perimeter of a right-angled triangle is 72 cm.
The lengths of its sides are in the ratio 3 : 4 : 5

Work out the area of the triangle.

..... cm^2

(Total 4 marks)

35. Here are the first 4 terms of a sequence.

2 9 16 23

(a) (i) Write down the next term in the sequence.

.....

(1)

(ii) Explain how you got your answer.

.....

(1)

(b) Work out the 10th term of the sequence.

.....

(1)

(Total 3 marks)

---

36. Alan, Bispah and Chan share a sum of money.

Alan gets $\frac{1}{8}$ of the money. Bispah gets $\frac{1}{2}$ of the money.

Chan gets the rest of the money. Alan gets £2.50

Work out how much money Bispah gets.

£ .....

(Total 2 marks)

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37. The diagram shows a metal plate in the shape of a rectangle.
The rectangle has length 20 cm and width 12 cm.
Two identical circles, each of diameter 6 cm,
have been cut out of the plate.

Work out the area of the shaded region of the metal plate.

(Use $\pi = 3$) Give your answer correct to the nearest cm^2.

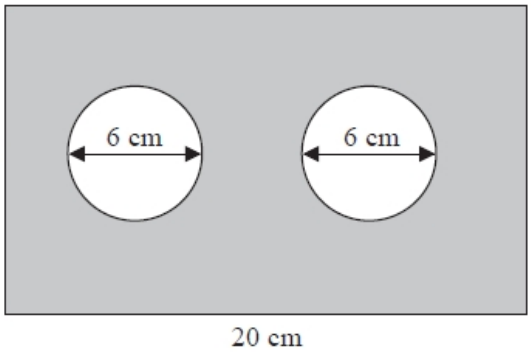


Diagram **NOT** accurately drown

..... cm^2

(Total 4 marks)

38. This is part of a bus timetable between Bury and Manchester.

Bury	08 25	08 55	09 15	09 30	09 45	10 05
Whitefield	08 34	09 04	09 24	09 39	09 54	10 14
Heaton Park	08 46	09 16	09 36	09 51	10 06	10 27
Cheetham	08 56	09 26	09 46	10 01	10 16	10 37
Manchester	09 05	09 35	09 55	10 10	10 25	10 48

(a) How many minutes should the 08 25 bus take to go from Bury to Manchester?

..... minutes

(1)

Daniel goes from Whitefield to Manchester by bus.
Daniel takes 17 minutes to get from his house to the bus stop in Whitefield.
He takes 15 minutes to get from the bus stop in Manchester to work.
Daniel has to get to work by 10 am. He leaves his house at 8.45 am.

(b) Does Daniel get to work by 10 am? You must show all your working.

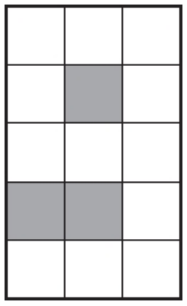
.....

(3)

(Total 4 marks)

39. A pattern is made with white squares and shaded squares.

Shade **one** more square to make a pattern with exactly 1 line of symmetry.



(Total 1 mark)

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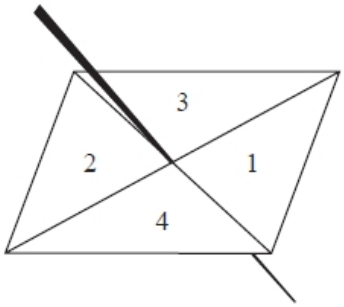
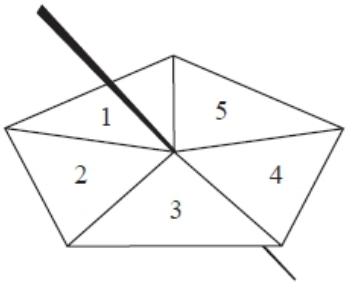
40. Here are a 4–sided spinner and a 5–sided spinner. The spinners are fair.





Jeff is going to spin each spinner once. Each spinner will land on a number.
Jeff will get his score by multiplying these two numbers together.

(a) Complete the possibility space diagram for each possible score.

4-sided spinner \ 5-sided spinner	1	2	3	4	5
1					
2					
3					
4					

(1)

Jeff spins each spinner once.

(b) Find the probability that Jeff gets

(i) a score of 6

.....

(ii) a score of 8 or more.

.....

(2)
(Total 3 marks)

END