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Year 7 Entrance and Scholarship Examination Mathematics

Specimen Paper A

TIME allowed for this paper: 60 minutes

Instructions

- Attempt all the questions.
- Do all your written work on this paper, **showing all your working.**
- Calculators must not be used.
- The numbers in square brackets are the marks available for each part of a question
- You must not write in the squares at the bottom right of each page
- There are 100 marks in total

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1. Calculate 546 + 287.

Answer: _____ [2]

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2. Calculate 546 – 287.

Answer: _____ [2]

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3. Calculate 546 × 4.

Answer: _____ [2]

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4. Calculate 2184 ÷ 7.

Answer: _____ [2]

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5. Calculate how much bigger 3¼ is than 1¾, writing your answer as a **decimal**.

Answer: _____ [2]

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6. Fill in the missing numbers of these sequences:

(a) 14 , 17 , 20 , 23 , _____ , _____

(b) 14 , 13.25 , 12.5 , 11.75 , _____ , _____

[3]

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7. (a) Work out ¼ of 48.

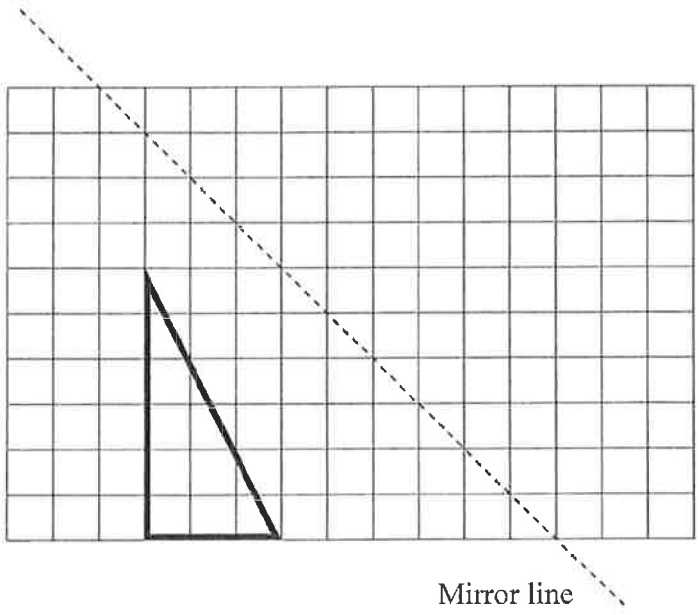
Answer: _____ [1]

(b) Work out ½ of ⅓ of ¼ of 48.

Answer: _____ [2]

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8. Draw the reflection of this triangle in the mirror line shown.



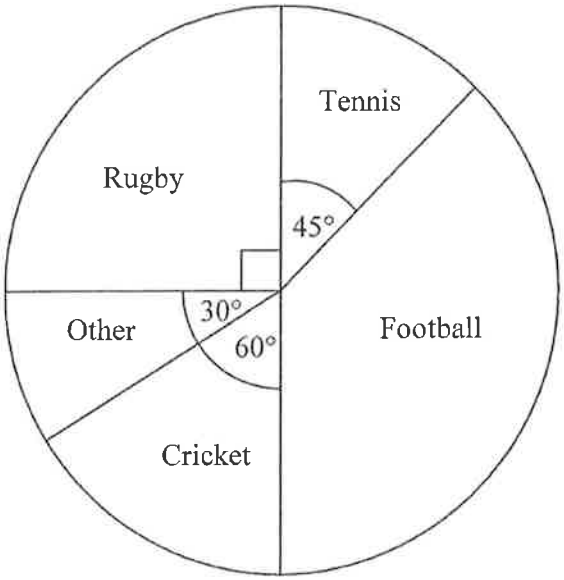
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9. The pie chart below represents data collected in a survey by a PE teacher about the favourite sports of a sample of school children.



(a) Write down the fraction of the school children who liked tennis, giving your answer in its lowest form.

Answer: _____ [2]

(b) A total of 240 children were asked to complete the survey. Calculate how many of the children preferred cricket.

Answer: _____ [2]

(c) Estimate how many children would say their favourite sport was football out of the whole school of 1200 pupils.

Answer: _____ [3]

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10. I buy 6 bags of chocolate coins from a shop and count the number of coins in each bag. The quantities were as follows:

8 , 7 , 11 , 6 , 9 , 7

(a) Write down the mode of the quantities.

Answer: _____ [1]

(b) Work out the mean (average) of the number of chocolate coins.

Answer: _____ [3]

(c) Work out the range of the quantities in the 6 bags.

Answer: _____ [2]

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11. A multipack of 12 cans of Ned's Cola costs £6.95.

A single can of Ned's Cola costs 65 pence if bought individually.

Calculate how much cheaper it is to buy a multipack of 12 cans than to buy 12 cans individually, giving your answer in pence.

Answer: _____ pence [3]

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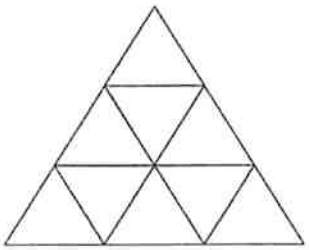
12. Arrange the following fractions in numerical size order, starting with the smallest.

$$\frac{3}{10}, \frac{1}{5}, \frac{3}{2}, \frac{1}{20}, \frac{1}{4}$$

Answer: _____, _____, _____, _____, _____ [3]

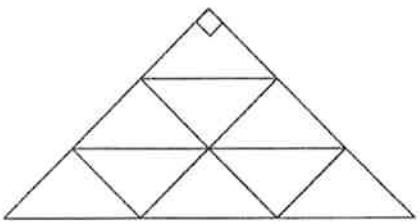
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13. (a) An equilateral triangle is divided into smaller equilateral triangles as shown below. State out how many angles of 60° there are in the diagram.



Answer: _____ [2]

(b) The diagram is now squashed to make the top angle 90°, turning all the triangles into right-angled isosceles triangles. Calculate how many acute angles there are in the diagram now.



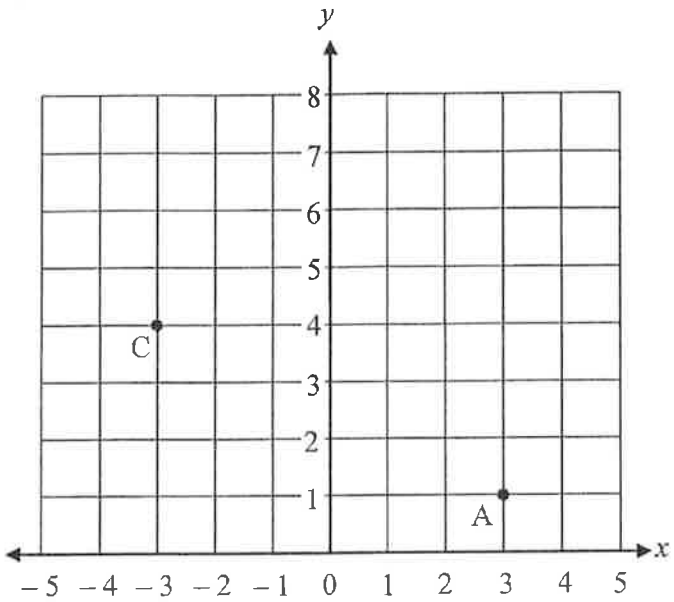
Answer: _____ [2]

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14. On the axes below, point A has coordinates (3,1).



(a) Write down the coordinates of point C.

Answer: (_____ , _____) [1]

(b) Plot the point with coordinates (5, 4) onto the axes **and label it B.**

[1]

(c) Plot another point, D, and then join ABCD **in that order** so that you form a quadrilateral shape with one line of symmetry.

[2]

(d) Write down the common name for the quadrilateral ABCD.

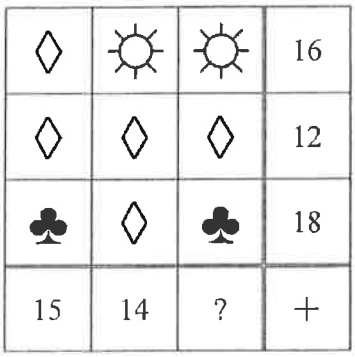
Answer: _____ [1]

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15. Each shape in this grid is hiding a particular number so that the three shapes in any row or column add up to the value written at the end of that row or column.



Work out the number that should replace the question mark.

Answer: _____ [3]

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16. Rhys and Sarah are on their bicycles and start 90 miles apart on a road, riding towards each other. Rhys is travelling at 10 mph and Sarah is travelling at 20 mph. They set off at the same time and both keep moving at constant speeds until they meet.

(a) Work out what distance each rider has cycled by the time they meet.

Rhys: _____ miles

Sarah: _____ miles [2]

(b) Write down the time taken for them to meet.

Answer: _____ [1]

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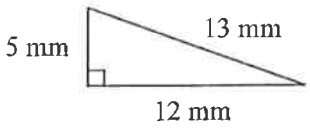
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17. (a) Find the area of the rectangle shown below.



Answer: _____ mm^2 [2]

George cuts the rectangle up into an exact number of right-angled triangles, each with sides as shown in the diagram below.



(b) Calculate the number of triangles that he cuts from the rectangle.

Answer: _____ [3]

(c) Find the combined perimeter of all the triangles that have been cut from the rectangle.

Answer: _____ mm [3]

(d) Convert this distance from millimetres into metres.

Answer: _____ m [1]

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18. On the island of Pythageuleria all vehicle number plates have 2 letters from the selection A, B, C, D, followed by a number 1, 2, 3 or 4.

For example:



Note that repeated letters are allowed.

(a) Calculate how many plates start with a double B.

Answer: _____ [1]

(b) Calculate how many plates there are that start with any repeated letter.

Answer: _____ [2]

(c) Calculate how many plates contain just one vowel and an odd number.

Answer: _____ [3]

(d) Given that there are 64 possible codes in total, calculate what fraction of the number plates have their two letters in alphabetical order, giving your answer in its lowest form.

Answer: _____ [3]

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19. A new design for a novelty watch gives the time in 24-hour clock format by showing a particular combination of lights below a set of numbers. The lit-up numbers are added together to find the actual time, with the first row showing the hour and the second row displaying the minutes.

For example, the display below represents the time 05:26 since:

	32	16	8	4	2	1
Hr				☼		☼
Mn		☼	☼		☼	

← 4 + 1 = 5

← 16 + 8 + 2 = 26

(a) Write down the time (in 24-hour format) represented by the display:

	32	16	8	4	2	1
Hr			☼	☼	☼	
Mn	☼	☼				☼

Answer: _____ : _____ [2]

(b) Mark the grid below to show the time "a quarter to ten in the evening".

	32	16	8	4	2	1
Hr						
Mn						

[3]

(c) Calculate how long it is between the times displayed on watch A and watch B below:

Watch A

	32	16	8	4	2	1
Hr			☼		☼	☼
Mn	☼			☼		☼

Watch B

	32	16	8	4	2	1
Hr		☼		☼		
Mn		☼		☼	☼	

Answer: _____ hours, _____ minutes [3]

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20. In four years time, Sam will be twice as old as he was four years ago. Calculate Sam's current age.

Answer: _____ years old [2]

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21. A packet containing seeds says it produces white, pink and blue flowers in such a proportion that, on average, for every one white flower grown there will be two pink and three blue flowers.

(a) I plant some seeds and get three white flowers. Write down how many blue flowers I should expect to grow.

Answer: _____ [1]

(b) I plant a total of 30 seeds in another patch of the garden. Calculate how many white flowers I would expect to get in this patch.

Answer: _____ [2]

(c) In another area of the garden, 24 blue flowers are grown. Calculate how many pink flowers I should expect to find here.

Answer: _____ [3]

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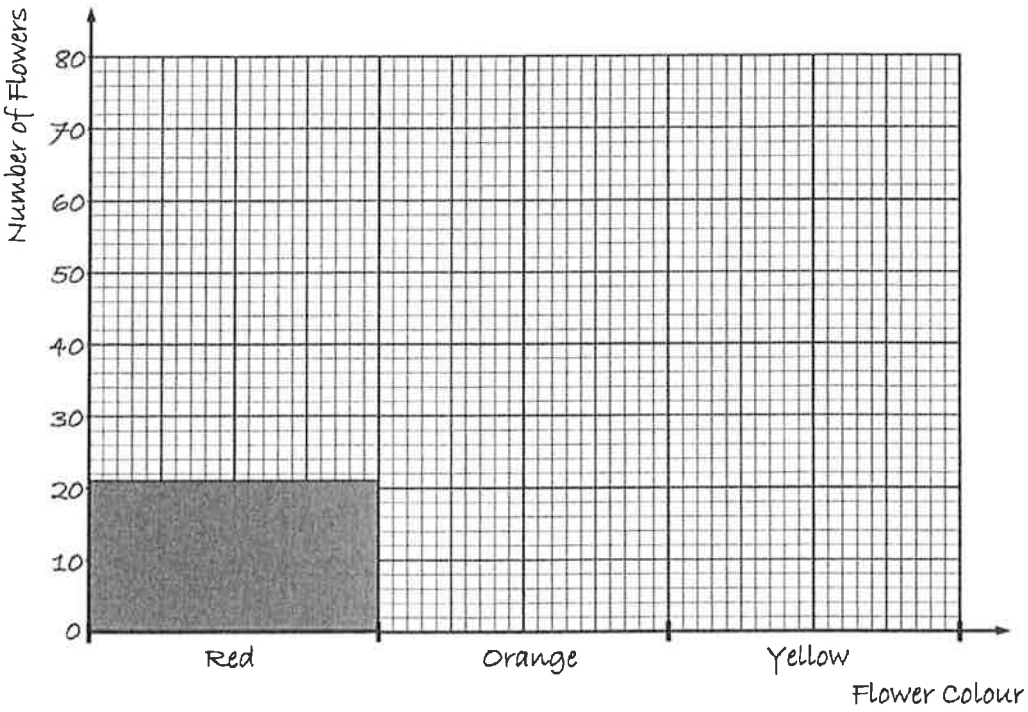
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21. continued...

A packet of a different type of seed produces red, orange or yellow flowers. Some students in a biology class plant 150 seeds. All 150 grow to produce flowers and the students draw up the results of the flower colours into a table and a bar chart as below.

(d) Complete the table and bar chart for the students' findings.

Flower colour	Red	Orange	Yellow
Number of flowers			72



[4]

(e) If I pick a flower at random from the 150 grown in the test, list the following possible outcomes in order of likelihood, starting with the least likely:

(i) picking a red or orange flower
(ii) picking a purple flower
(iii) picking a orange or yellow flower
(iv) picking a yellow flower

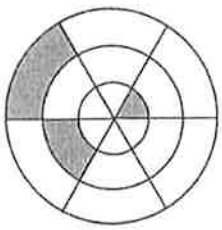
Answer: _____ , _____ , _____ , _____ [3]

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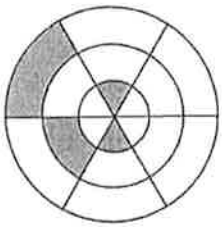
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22. (a) Shade in one more section on the grid below so that the overall shape has a single line of symmetry, marking your mirror line on the diagram.



[2]

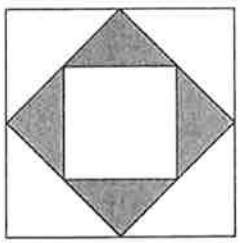
(b) Now shade two sections in this second grid so that the overall shape has an order of rotational symmetry of two.



[2]

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23. The diagram below is made from three squares.



Calculate the fraction of the larger square that is shaded, giving your answer in its lowest form.

Answer: _____ [3]

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End of the Examination

If you have time, go back and check your answers and make sure that you have shown all of your working.

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