



St Mary's School
CAMBRIDGE

Year 8 Maths

Sample Entrance Examination

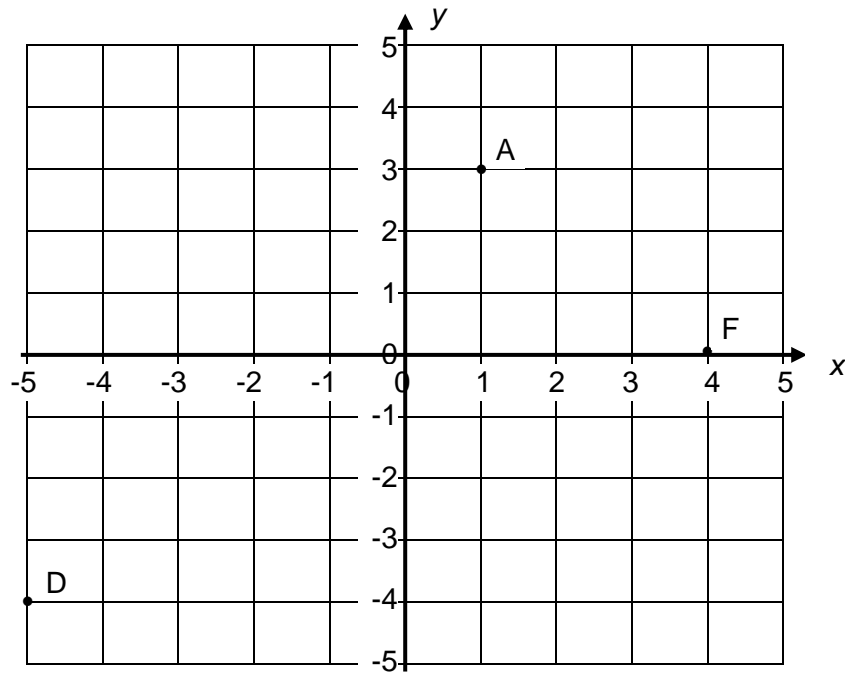
Time allowed: 60 minutes

Name: _____

INSTRUCTIONS

1. You may **NOT** use a calculator.
2. Work through as many questions as you can.
3. Full marks will be given to solutions that show a complete method.
4. If you do not understand a question, miss it out and go on to the next one.
5. When you have done all that you can, return to the question(s) that you have missed.

1. Look at the diagram below.



(a) Write down the coordinates of the points A, D and F.

$$A = (\quad , \quad)$$

$$D = (\quad , \quad)$$

$$F = (\quad , \quad)$$

(b) On the grid above, plot the points B (-3,2), C (3,-4) and E (0,-5).

(c) Draw the line that passes through the points A and B.

Make the line reach to the edge of the grid.

Write down the coordinates of two or more points on this line.

(d) The points X and Y also lie on this line but are not on the grid. Complete their coordinates.

$$X = (\quad , \quad)$$

$$Y = (\quad , \quad)$$

2. Complete this sequence of numbers: 31, 34, 37, 40, ____, 46, 49, ____, ____

3. Consider this list of numbers: 216, 46, 49, 93, 17.

From the list, write down (a) a square number

(b) a cube number

(c) a prime number

4. Work these out:

(a) 9^2

(b) $8^2 - 3^3$

(c) $\sqrt{169}$

(d) $3\sqrt{8} \times \sqrt{225}$

5. I buy two items, one costing £1.71 and the other £3.08.
I pay with a £5 note.
How much change do I receive?

6. A postman delivers 21 letters to each of 39 premises.
How many letters does he carry in his bag at the start of his delivery?

7. Work out the following:

(a) $21 - 4 \times 5$

(b) $6 + 7 \times 3 - 27 \div 3$

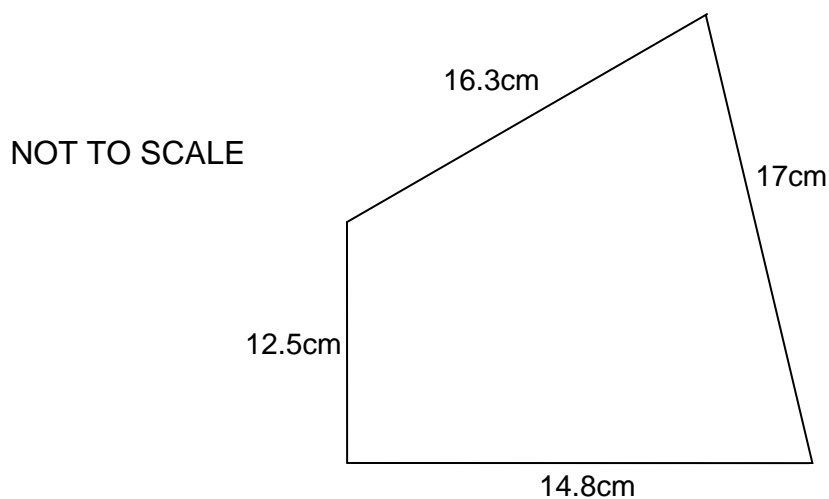
(c) $(24 + 8) \div (6 - 2)$

8. Solve each of these equations, showing all your working:

(a) $9a = 4a + 30$

(b) $3b + 41 = 6b + 20$

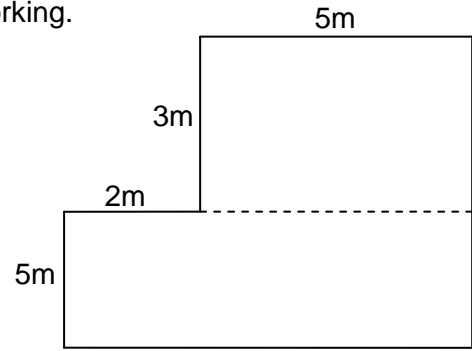
9. Find the perimeter of this quadrilateral.



10. This diagram shows a plan of Catherine's bedroom floor.

NOT TO SCALE

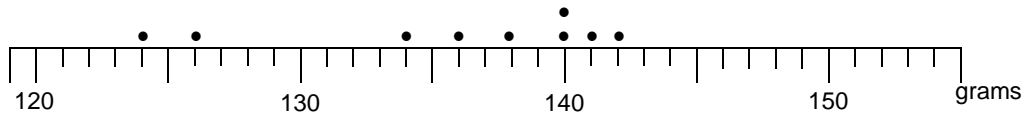
(a) Find the area of the floor, showing all your working.



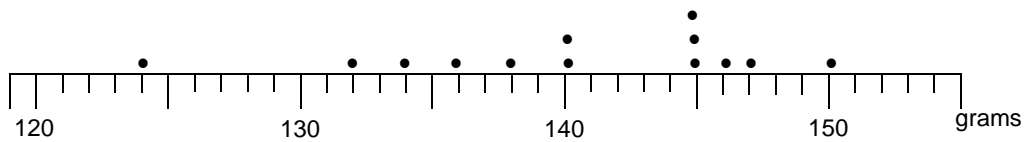
(b) Find the perimeter of the bedroom.

11. These dot plots show the weights of some litters of puppies.

Dalmations



Golden retrievers



Use the dot plots to complete the following:

- (a) The median for the dalmations is _____.
 The range for the dalmations is _____.
- (b) The median for the golden retrievers is _____.
 The range for the golden retrievers is _____.
- (c) Write a couple of sentences comparing the two groups of puppies.

12. Work out the following:

- (a) $5 - 8$ (b) $-3 - 4$ (c) $-9 + 6$
- (d) $0 + -2$ (e) $-4 - -3$ (f) $6 - +7 - -4 - +6 + +9$

13. Complete these tables:

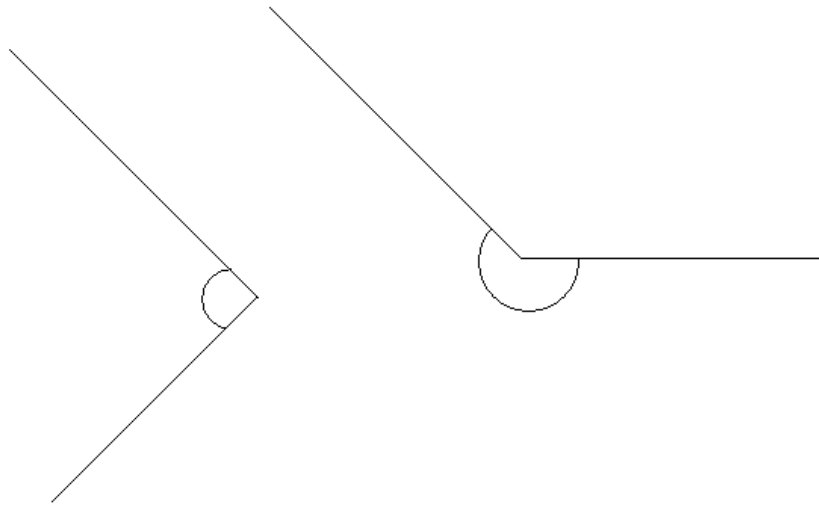
(a)

n	\rightarrow	$\frac{n}{7}$
21	\rightarrow	
	\rightarrow	5
	\rightarrow	1
0	\rightarrow	

(b)

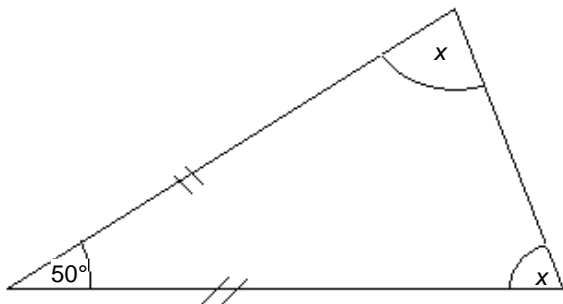
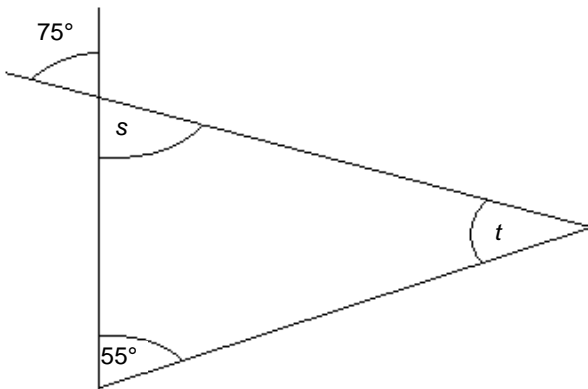
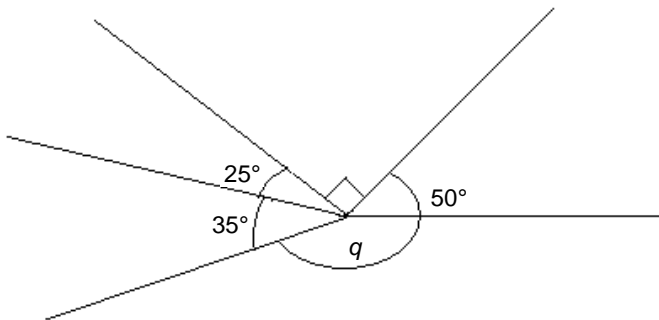
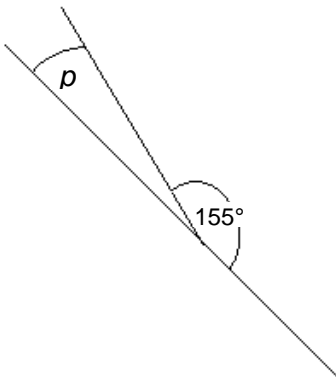
n	\rightarrow	$3n - 2$
4	\rightarrow	
7	\rightarrow	
	\rightarrow	28
	\rightarrow	-2

14. Measure each angle shown in degrees:

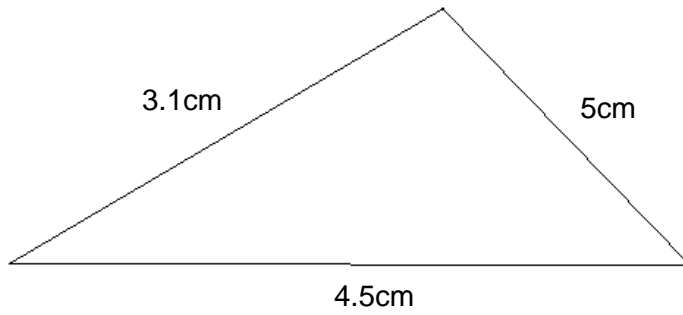


15. Use your protractor to draw an angle of 143° .

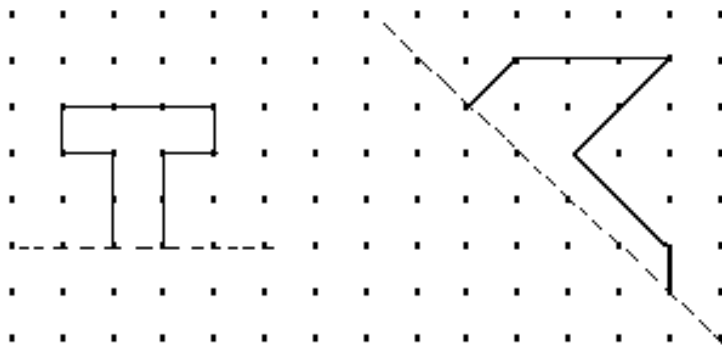
16. Calculate the size of each angle marked with a letter.



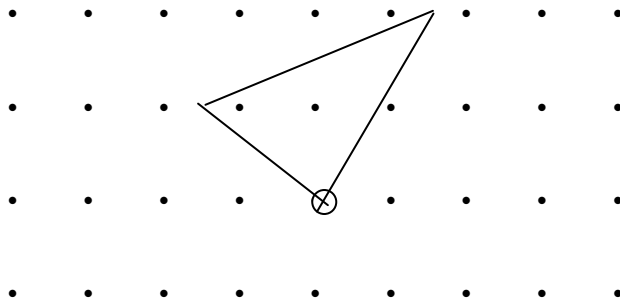
17. Do an accurate drawing of the triangle sketched here.



18. Imagine that a mirror is placed on the dotted line in each of these diagrams. Draw the image of each shape in the mirror.



19. Complete this design so that it has a rotational symmetry of order 4 about the marked centre.



20. For a game two spinners are used, one on a square and the other a regular pentagon. In the game the spinners are spun and the scores are added together. Complete the grid below to show all the possible totals.



		Pentagon Spinner				
		1	2	3	4	5
Square Spinner	+					
	1	2				
	2					
	3					
	4					

Use your grid to find the probabilities of getting:

- (a) A total of 4
- (b) A total of 0
- (c) A total of 7 or more
21. (a) List the first eight multiples of 8
- (b) List the first eight multiples of 3
- (c) Write down the lowest common multiple of 8 and 3

22. (a) List all the factors of 24

(b) List all the factors of 40

(c) Write down the highest common factor of 24 and 40

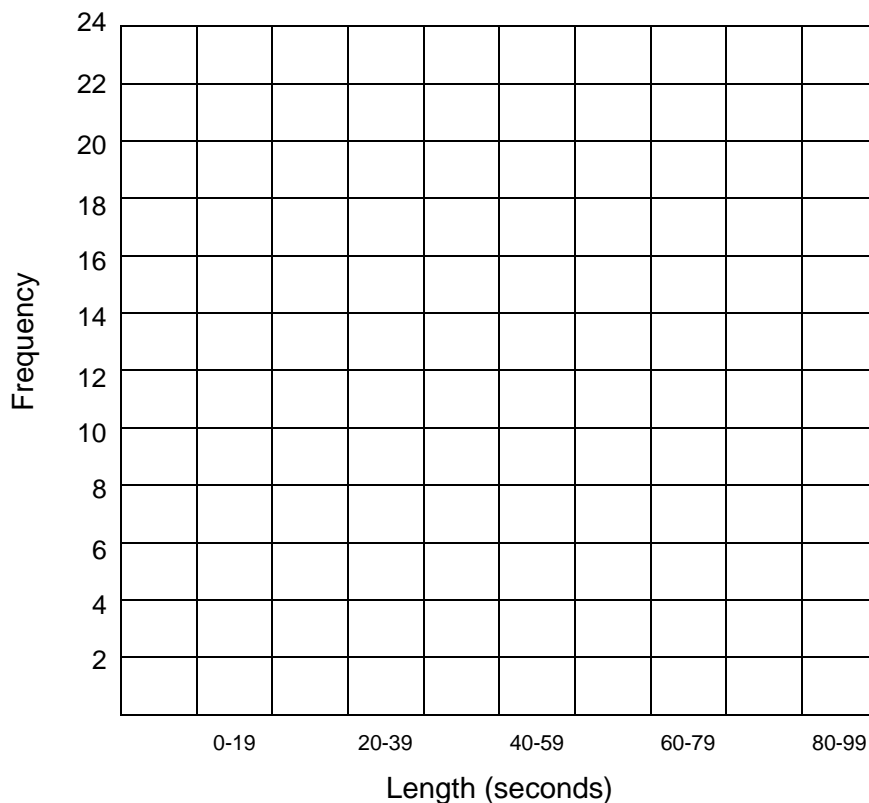
23. Damon and Ali recorded the length, in seconds, of all the adverts shown between 5:00pm and 11:00pm on one day. Here are the results:

21, 38, 58, 7, 36, 47, 63, 15, 29, 34, 41, 59, 84, 26, 31,
46, 63, 25, 39, 68, 7, 12, 35, 58, 76, 21, 34, 44, 57, 90,
8, 26, 36, 44, 79, 51, 63, 7, 24, 35, 11, 36, 41, 53, 64,
73, 27, 31, 44, 84, 36, 60, 65, 8, 18, 23, 33, 43, 73, 24.

(a) Complete the grouped frequency table for this data:

Length (seconds)	Tally	Frequency
0 - 19		
20 - 39		
40 - 59		
60 - 79		
80 - 99		

(b) Draw a bar chart to represent this data.



- (c) Ali says 'The most common length of an advert is between 20 and 39 seconds'. State, with reasons, whether you agree with Ali's hypothesis about the length of adverts.

24. (a) Change $\frac{37}{9}$ into a mixed number.

(b) Change $7\frac{4}{5}$ into an improper fraction.

25. Work out the following, simplifying your answers if possible:

(a) $\frac{8}{9} - \frac{2}{3}$

(b) $4\frac{1}{3} + 5\frac{4}{5}$

(c) $5\frac{4}{7} - 2\frac{1}{14}$