

Candidate Name:



St Swithun's

Mathematics

14+ Entry

Past paper

Time allowed: One hour

Instructions to Candidates

Attempt ALL questions, writing your answers in the spaces provided.

Do not use any rough paper – all working must be shown on the examination paper.

CALCULATORS are allowed for this paper.

1. Solve the following equations.

a) $3x + 4 = 19$

Answer: $x = \dots\dots\dots$ [2 marks]

b) $2x - 4 = 3x - 6$

Answer: $x = \dots\dots\dots$ [2 marks]

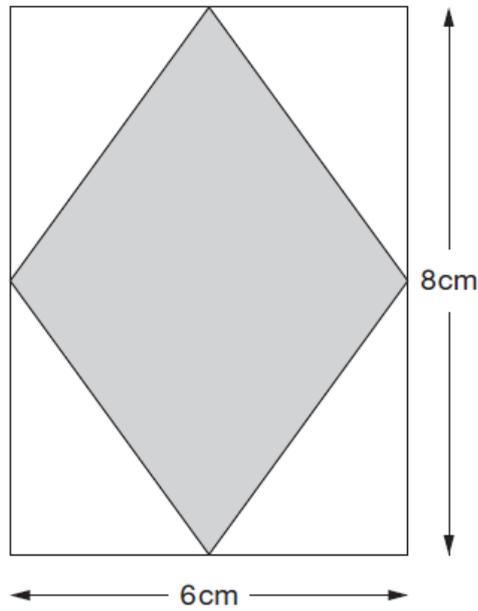
c) $3(2x - 3) = 4(5 - x)$

Answer: $x = \dots\dots\dots$ [3 marks]

d) $\frac{3}{x+1} + 3 = 0$

Answer: $x = \dots\dots\dots$ [3 marks]

2. Inside the rectangle below is a shaded rhombus.
The vertices of the rhombus are the midpoints of the sides of the rectangle.



Not drawn accurately

- a) Find the area of the shaded rhombus.

Answer..... [2 marks]

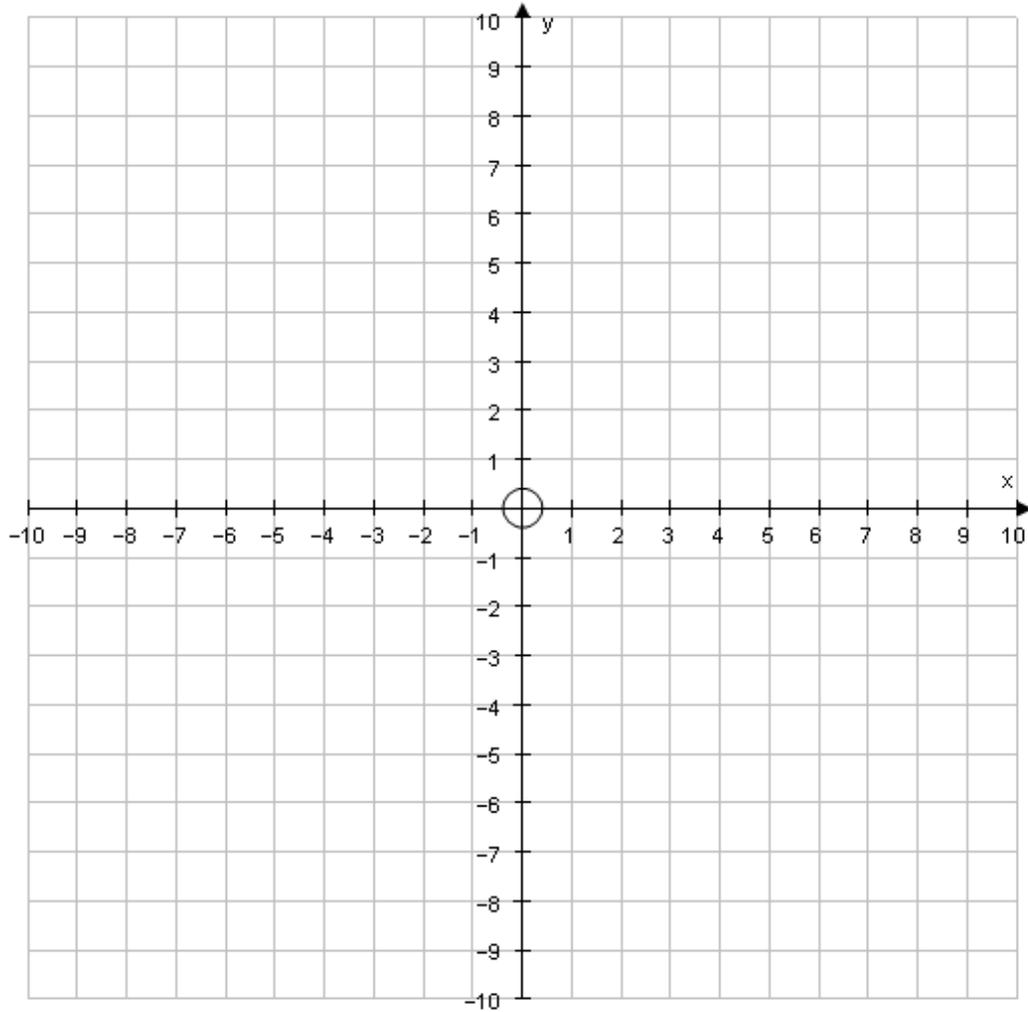
- b) The rhombus is the cross section of a prism, with volume 96 cm^3 . Find the length of the prism.

Answer..... [2 marks]

3. a) On the grid below draw the graphs of

$$y = x + 1 \quad \text{and} \quad y = 8 - 2x$$

[3 marks]



b) Write down the co-ordinates of the point where these graphs cross.

Answer: $x = \dots\dots\dots y = \dots\dots\dots$ [2 marks]

4. A shop has this special offer.

Reduction of 10% when your bill is between £50 and £100
Reduction of 20% when your bill is more than £100

Before the reductions, Marie's bill is **£96** and Richard's bill is **£108**

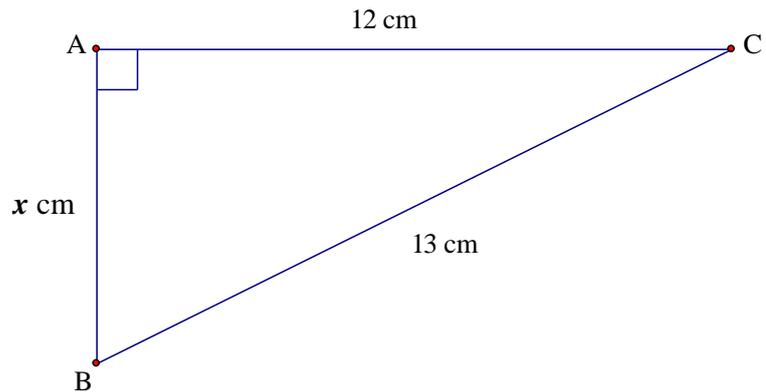
After the reductions, how much did they each pay? You **must** show working to explain your answer.

Comment on your answers.

Answer.....[4 marks]

Comment.....[1 mark]

5. Find the value of x .



Answer.....[3 marks]

6. Given that $x = -3$ and $y = 2$, find the values of the following:

a) $(2x)^2$

Answer.....[1 mark]

b) $-7 + 3x$

Answer.....[1 mark]

c) $11 + xy$

Answer.....[1 mark]

d) $10 - x^2$

Answer.....[1 mark]

e) $\frac{1}{2}x(y + 8)$

Answer.....[1 mark]

7. The Clock Tower of the Houses of Parliament in London used to hold the record for having the largest four-faced clock in the world.

- a) If each face is a circle of diameter 8 m, what is the combined area of all four faces?
Give your answer correct to 3 significant figures.

Answer [3 marks]

- b) A School Maths exercise book is approximately 15 cm by 20 cm.
Approximately how many exercise books would be needed to cover all four clock faces?

Answer [3 marks]

8. A teacher has number cards, numbered from 1 to n .



The teacher says:

I have n number cards, numbered from 1 to n
 $\frac{1}{5}$ of the cards show square numbers.

There are three possible values for n . Give them all.

$n = \dots\dots\dots, n = \dots\dots\dots, n = \dots\dots\dots$ [3 marks]

9. The mean of five positive whole numbers is 4 and the mode is 7.
What are the five numbers? Explain how you arrived at your answer.

Answer $\dots\dots\dots$ [4 marks]

10. Teresa measures the lengths of 10 carrots. The lengths, in cm, are

13, 11, 17, 24, 18, 16, 16, 11, 12, 18

a) What is the range of this data?

Answer [2 marks]

b) What is the median length?

Answer [3 marks]

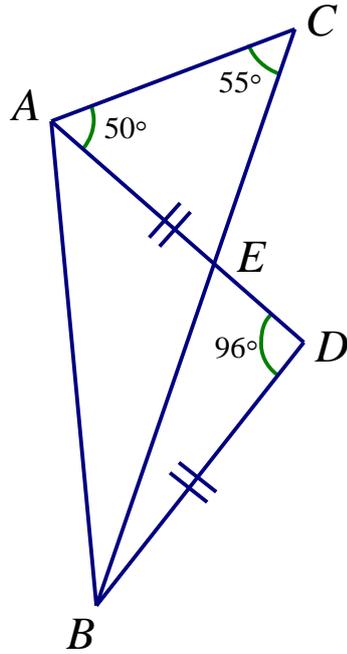
c) Teresa finds another carrot and, if this one is included, calculates that the mean length of all the carrots is 17 cm.
What is the length of the extra carrot?

Answer [4 marks]

11. If $S = \frac{1}{6}n(n + 1)(2n + 1)$ and we know that $n = 7$, find the value of S .

Answer [3 marks]

12. In the diagram $AD = BD$ and angles DAC , ACE and ADB are all given.
 Calculate the size of angle DBE .
 Give reasons for each stage of your answer.



Proof with reasons:

Diagram not to scale.

Answer [5 marks]

13. The total cost of a bat and a ball is £1.10. The bat costs £1 more than the ball.
 What is the cost of the ball?

Answer[2 marks]

14. Pippa is visiting her grandparents. She spends half the time playing, a third sleeping and the remaining 35 minutes eating.
How long is her visit?

Answer[2 marks]

15. Is the following argument valid?

*All roses are flowers.
Some flowers fade quickly.
Therefore some roses fade quickly.*

Explain your thinking carefully.

[2 marks]

16. A single amoeba in a beaker can divide into two in one minute. After another minute, each of those two amoebas splits into two, leaving four amoebas. At the end of forty minutes the beaker is full. How many minutes did it take for the beaker to be half full of amoebas?

Answer[2 marks]

END OF QUESTIONS