

Candidate Number \_\_\_\_\_

## **PORTADOWN COLLEGE**

**Year 10**

### **Further Mathematics Assessment**

#### **SAMPLE PAPER**



#### **INSTRUCTIONS TO CANDIDATES**

Write your candidate number in the space above.

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

Answer **all** questions.

Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

Remember to check over your work once you have completed the paper.

You may **use a calculator** for this paper

#### **INFORMATION FOR CANDIDATES**

The total mark for this paper is **66**

The time allowed is **1 hour**

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

***Note: This sample paper does not include all topics/styles of question which could be tested.  
Please see topic list.***

1. Leanne scores the following points in a game

16, 8, -4, -14, 4, 16, -12

a) Find Leanne's mean score

Answer \_\_\_\_\_ [2]

b) Find Leanne's median score.

Answer \_\_\_\_\_ [2]

c) Find the range of Leanne's score

Answer \_\_\_\_\_ [1]

2. Use your calculator to work out the value of

$$\frac{6.3(9.135 - 2.1)}{8.9 + 1.2}$$

Write your answer to 3 significant figures.

Answer \_\_\_\_\_ [2]

3. The total population of France in 1990 was estimated to be 57 981 000  
Of these, 8 697 150 lived in the Centre Region.

What percentage of the population lived in the Centre Region?

Answer \_\_\_\_\_ % [2]

4. Simplify

a)  $t - 2v + v - 2t$

Answer \_\_\_\_\_ [1]

b)  $2(t - 2v) - (v - 2t)$

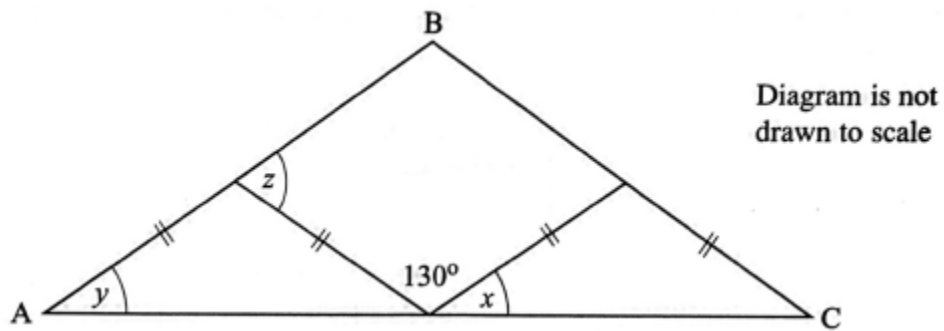
Answer \_\_\_\_\_ [3]

5. 30 children attend a swimming club. The ratio of seniors to juniors is 2 : 3

How many juniors are in the club?

Answer \_\_\_\_\_ [2]

6. In the diagram below, triangle ABC is isosceles with  $AB = BC$ .



Write down the sizes of angles  $x$ ,  $y$  and  $z$ .

Answer  $x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_

$z =$  \_\_\_\_\_ [3]

7. If  $p = -3$ ,  $q = 4$  and  $r = 2$ , find the value of

a)  $2p^2$

Answer \_\_\_\_\_ [1]

b)  $\frac{p-r}{q}$

Answer \_\_\_\_\_ [1]

8. Solve the following equations, giving your answers as **exact values** where necessary.  
[A solution by trial and improvement will not be accepted.]

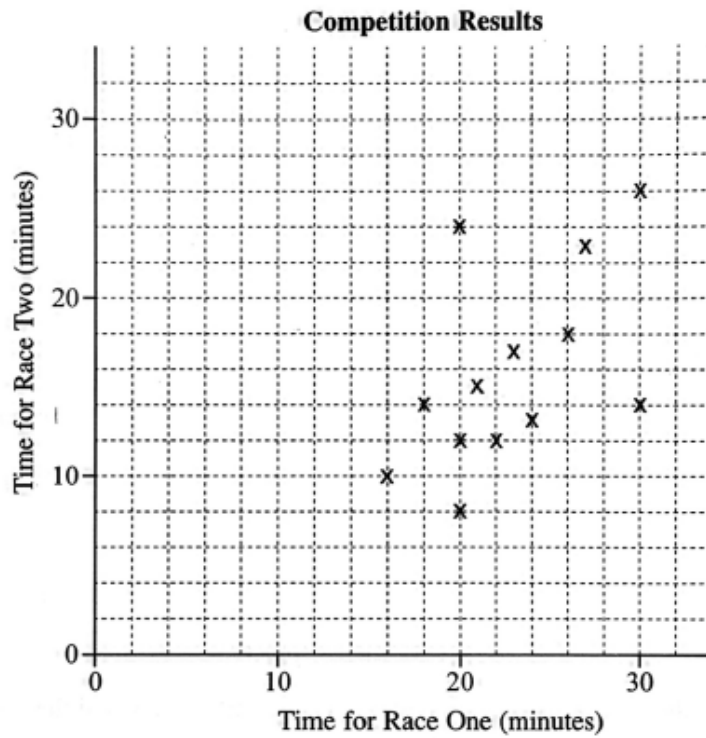
a)  $4 + 3x = 8 - x$

Answer  $x =$  \_\_\_\_\_ [2]

b)  $5(x - 1) = 2x - 7$

Answer  $x =$  \_\_\_\_\_ [3]

9. The scatter graph below shows the performance of competitors over 2 different races during a competition.



- a) Jack took 24 minutes for Race One and 20 minutes for Race Two.

Plot Jack's time for these races on the scatter graph above.

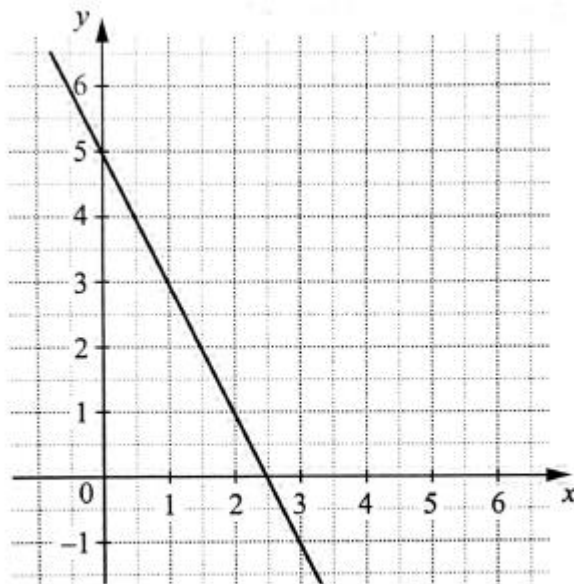
[1]

- b) Mary completed Race One in a time of 28 minutes. She was injured at the start of Race Two and was unable to continue.

By drawing a line of best fit on the scatter graph, estimate a time for Mary in Race Two.

Answer \_\_\_\_\_ minutes [2]

10. a) Find the gradient of the line drawn below



Answer \_\_\_\_\_ [2]

b) On the grid above, draw the line  $y = 2x - 1$

[2]

11. Factorise fully

a)  $8y - 12$

Answer \_\_\_\_\_ [1]

b)  $7x^2 + 14x$

Answer \_\_\_\_\_ [2]

12. Expand and simplify

a)  $(x + 3)(x + 2)$

Answer \_\_\_\_\_ [2]

b)  $(2x + 1)(3x - 5)$

Answer \_\_\_\_\_ [2]

13. The diagram shows a rhombus ABCD. AM is 38.4 cm and DM is 16 cm.

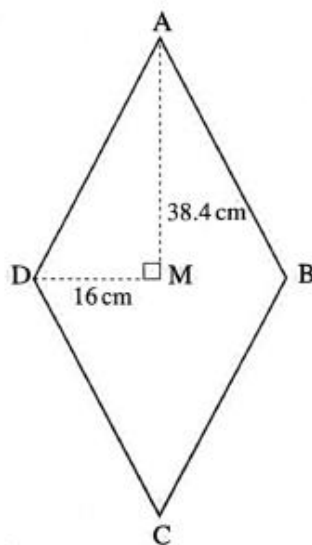


Diagram is not drawn to scale.

Calculate the length of AD

Answer \_\_\_\_\_ cm [3]



14. A baker is making a cake for Tom. He uses a cake tin in the shape of a letter T, as shown below.

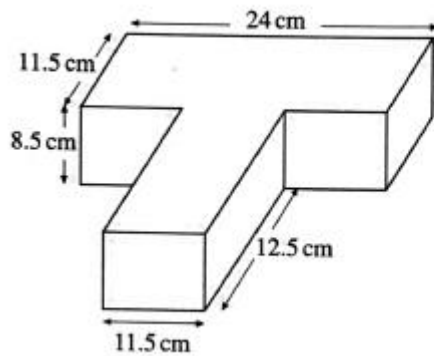


Diagram is not drawn to scale.

Calculate the volume of the cake tin.

Answer \_\_\_\_\_  $\text{cm}^3$  [3]

15. The back yard of a house has an area of  $9\frac{1}{3}\text{m}^2$ .

$\frac{5}{8}$  of the yard is going to be paved.

What area of the yard will be paved? \*Give your answer as an exact value.\*

Answer \_\_\_\_\_  $\text{m}^2$  [2]

16. A design is made from 4 identical parallelograms, as shown below.

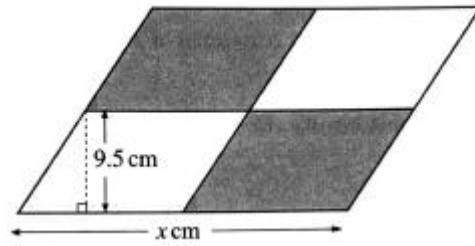


Diagram is not drawn to scale.

The area of the whole design is  $463.6 \text{ cm}^2$ .  
What is the length,  $x \text{ cm}$ ?

Answer  $x =$  \_\_\_\_\_ [3]

17. In March 2022 Mrs Brown sold her house for £160 000.

This was a 13% increase compared to when she bought it 2 years ago in 2020.

What was the price of the house, to the nearest £100, when she bought it in 2020?

Answer £ \_\_\_\_\_ [3]

18. The table shows information about 100 T-shirts in a shop.

	Small	Medium	Large
Black	10	14	12
White	13	18	19
Red	3	6	5

One T-shirt is taken at random.

What is the probability that the T-shirt was a medium?

Answer \_\_\_\_\_ [2]

19. Solve, giving your answer as a mixed number.

[A solution by trial and improvement will not be accepted.]

$$\frac{8x+1}{2} = 9$$

Answer  $x =$  \_\_\_\_\_ [3]

20. Simplify  $2y^3 \times y^2$

Answer \_\_\_\_\_ [1]

21. The area of a circle is  $98.55 \text{ cm}^2$ .  
Work out the diameter of this circle.

Answer \_\_\_\_\_ cm [3]

22. Tim is  $x$  years old.  
Alanna is 10 years older than Tim.  
John is 3 times older than Tim.  
Together their ages sum to 90 years.

- a) Form an equation to represent the information above.

Equation \_\_\_\_\_ [2]

- b) Solve the equation to find Tim's age.

Answer \_\_\_\_\_ [2]