



Year 2 Mid-Programme Entry Examinations 2019

Mathematics

Saturday 1st June 2019

Time allowed : 2 hours

You must have:

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Mark

Instructions to candidates

Answer the questions in the spaces provided – there may be more space than you need. Without sufficient working, correct answers may be awarded no marks.

Information to candidates

This paper has 24 questions.

There are 14 pages in this question paper.

Full marks may be obtained for answers to all questions.

The total mark for this paper is 120

The marks for **each** question are shown in brackets **(2)**

- *use this as a guide as to how much time to spend on each question.*

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.

Calculators are NOT allowed

1. Here are the ingredients needed to make 12 muffins.

| Ingredients to make 12 muffins |
|--------------------------------|
| 300g flour |
| 150g sugar |
| 250 ml milk |
| 100g butter |
| 2 eggs |

Sandra wants to makes 60 muffins.

(a) Work out how much of each of the following ingredients she will need:

- Flour g
- Sugarg
- Milkml
- Butter g

(2)

(b) Jason also makes some muffins. He uses 625ml of milk.

How many muffins did he make?

.....

(2)

2. Calculate the following:

(a) $18 - 12 \div (-3) + 4 \times (-2) + 18 \div 2$

.....

(2)

(b) $20 - (3 - 5)^2 \times (1 - 3)^3$

.....

(3)

(c) $0.517 \div 10^3$

.....

(2)

3. Work out the following, giving your answer as a mixed number.

$$\left(1\frac{1}{5} + \frac{7}{8}\right) \div \frac{3}{10} =$$

.....

(3)

4. Andreas, Benjamin and Christopher share a sum of money. Andreas gets $\frac{1}{2}$ of the money and Benjamin gets $\frac{1}{8}$ of the money. Christopher gets the remaining 375 euros.

(a) Work out how much money Andreas gets.

.....

(3)

(b) Work out the ratio of money that Benjamin (B) gets to Christopher (C) in the form B : C where B and C are whole numbers.

.....

(2)

5. Simplify the following:

(a) $13x - 7x + 2x$

.....
(2)

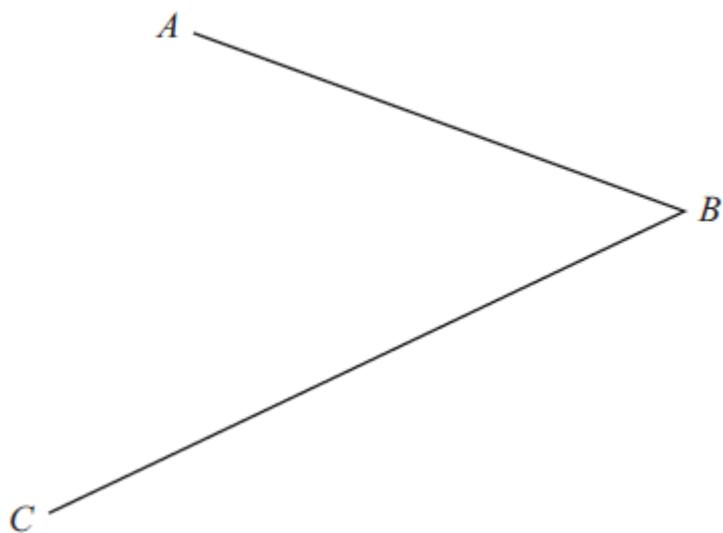
(b) $(3a^2b)^3$

.....
(3)

(c) $\frac{27fg^5h^3}{9gh^2}$

.....
(3)

6. Use a ruler and compasses only to construct the bisector of angle ABC. You must show all your construction lines.



(2)

7. Write each of the numbers 31 , 32 , 33 , 34 , 35 and 36 in the spaces below, using each number only once, to make all the statements true.

..... is a multiple of 8.

..... has exactly four factors.

..... is a square number.

..... is a prime number.

..... is a factor of 105.

..... is a multiple of 3.

(6)

8. (a) Circle the fraction which has a different value from the others:

$$\frac{6}{9} \qquad \frac{34}{51} \qquad \frac{18}{27} \qquad \frac{7}{10}$$

(b) Circle the smallest of the following fractions:

$$\frac{1}{4} \qquad \frac{1}{5} \qquad \frac{5}{16} \qquad \frac{1}{3}$$

(c) Circle the largest of the following fractions:

$$\frac{2}{3} \qquad \frac{7}{9} \qquad \frac{17}{27} \qquad \frac{1}{2}$$

(3)

9. The mean of seven numbers is 12. An eighth number is included and the mean decreases to 11. Find the value of the eighth number which was included.

.....

(3)

10. Andreas has four rectangular tiles which he arranges as shown below, leaving a square hole in the middle of the tiles.

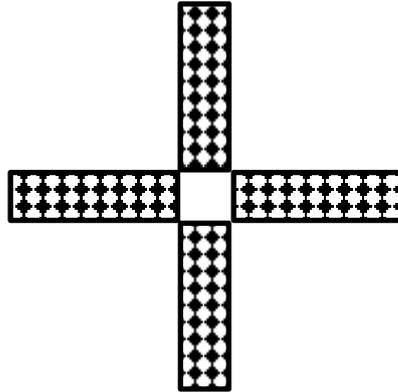


Diagram is not drawn to scale

The hole in the middle has an area of 400 cm^2 .

(a) Calculate the width of one of the tiles.

..... cm
(1)

The area of the four tiles combined is 12 times as large as the area of the hole in the middle.

(b) Calculate the length of one of the tiles.

.....cm
(3)

(c) Work out the perimeter of one of the tiles, giving your answer in metres.

.....m
(2)

11. Write the following in order of size, with the smallest first

- (a) -5 7 -8 -1 13 3

- (b) 0.008 0.00801 $\frac{810}{10000}$ 0.0799

(2)

12.

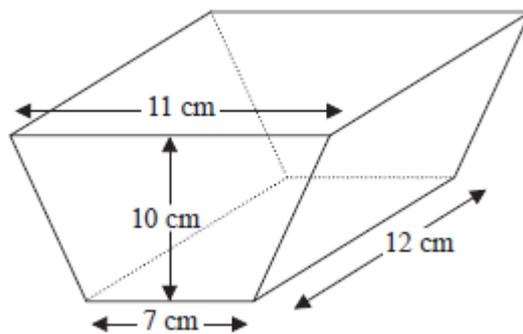


Diagram is not drawn to scale

The diagram shows a solid prism. The cross section of the prism is a trapezium.

- (a) Work out the area of the trapezium.

..... cm²
(2)

- (b) Work out the volume of the prism.

..... cm³
(2)

13. Expand and simplify the following:

(a) $3 - 7(x - 2)$

.....
(2)

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

.....
(3)

(c) $\frac{x^2}{4}(12x - 8xy^2)$

.....
(3)

14. Belinda counts the number of birds visiting her garden every day for a week. The counts were:

17 12 8 16 2 5 10

(a) Find the median number of birds.

.....
(2)

(b) Write down the range.

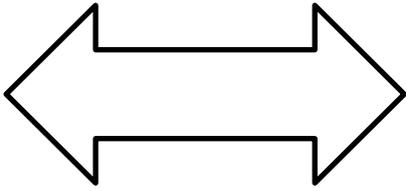
.....
(1)

(c) What is the mean number of birds visiting her garden for the seven days.

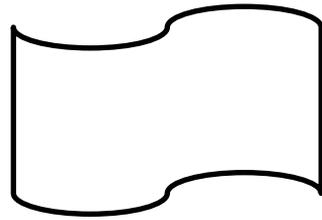
.....
(3)

15. Draw any lines of symmetry on these shapes. Some may have none or more than one.

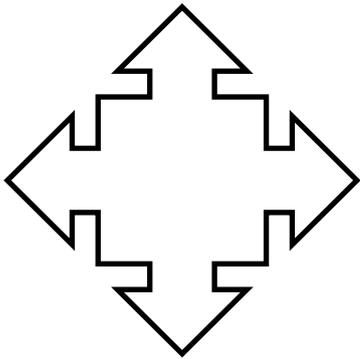
(a)



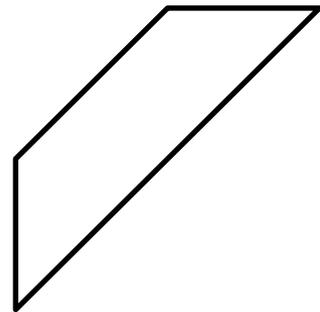
(b)



(c)



(d)



(4)

16.(a) Write down the missing terms in each of the following sequences:

(i) , 16, 8, 4,, 1

(ii) 1, 2, 6, 24,, 720,

(4)

(b) Work out the n th term of the following sequence:

53 , 47 , 41 , 35

.....

(2)

17. Solve the following equations:

(a) $4x + 5 = 17 + 8x$

.....
(2)

(b) $6(3y + 5) = 39$

.....
(2)

(c) $\frac{4m + 9}{3} = 7 - 2m$

.....
(3)

18.(a) Work out the value of x in the triangle below.

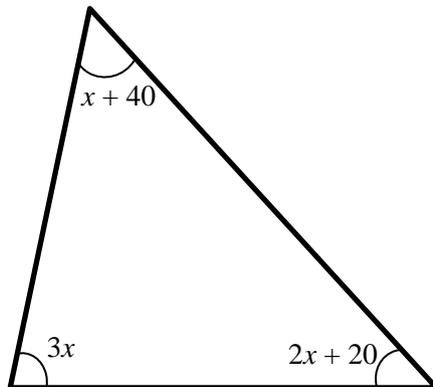


Diagram is not drawn to scale

.....
(3)

(b) What type of triangle is the above? Circle the correct word below.

Equilateral

Isosceles

Right angled

Scalene

(1)

19. Joshua is four times older than his brother Ted. In four years' time Joshua will be twice as old as Ted. Let x represent Teds age now.

(a) Write an expression for Joshua's age now.

.....
(1)

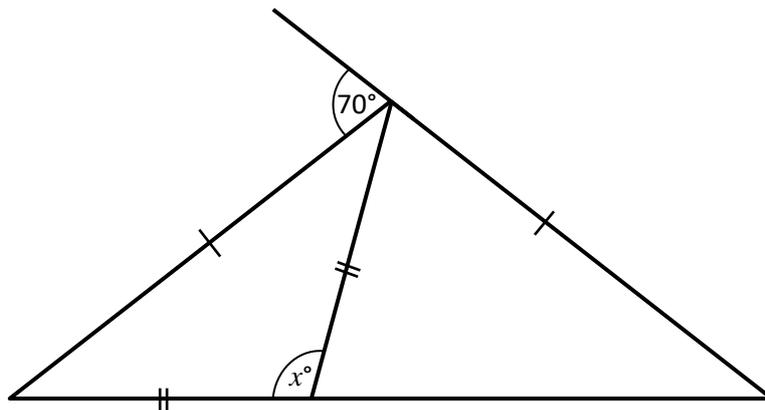
(b) Form an equation with the above information.

.....
(2)

(c) Solve this equation to find how old Joshua is now.

.....
(3)

20. Work out the value of x from the diagram below.



.....
(2)

21. Lucy increases all the prices on her café menu by 8%. **Before** the increase, the price of a dessert was €4.25.

Work out the price of the desert after the increase.

.....
(2)

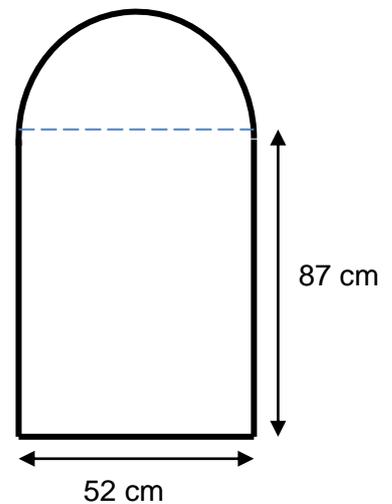
22. An arched window is in the shape of a rectangle attached to a semicircle as shown in the diagram to the right.

The rectangle has length 87cm and a width of 52cm.

(Use $\pi = 3$)

Calculate:

(a) the perimeter around the outside of the arched window.

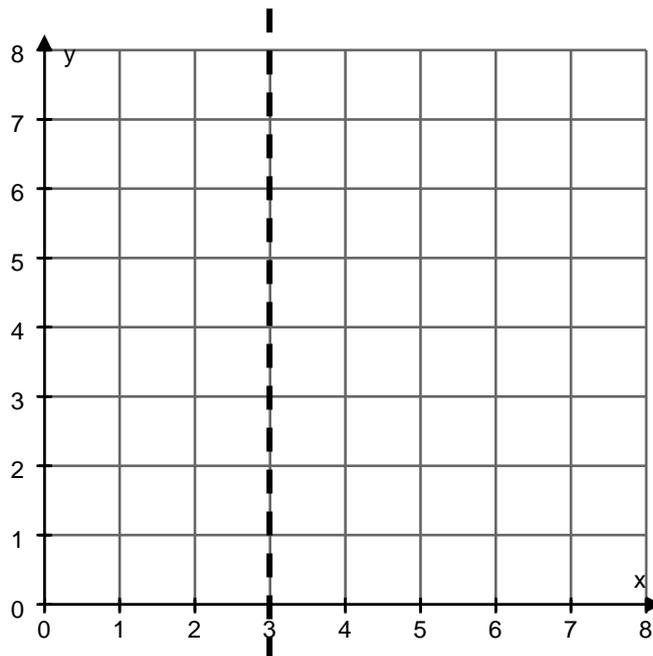


..... cm
(3)

(b) the area of the arched window.

..... cm²
(4)

23. A, B and C are three points on a grid. A is at (5, 2), B is at (4, 5) and C is at (3, 0).



- (a) Plot and label the three points A, B and C, and then join the three points and lightly shade the triangle you have formed. (3)

A mirror line is marked as the dotted line at $x = 3$. The triangle is reflected in this mirror line so that point A ends up at a new point D and point B ends up at a new point E.

- (b) Draw the reflected image of the triangle in this mirror line and label the two new points D and E. (2)

- (c) Write down the co-ordinates of these two new points D and E.

D (..... ,) and E (..... ,)

(2)

24. A Taxi firm owns a yellow and a black taxi cab. The yellow taxi can carry up to four passengers. The black taxi can carry up to five passengers. Both taxis are in continuous use, i.e. they always have at least one passenger.

(a) Complete the table showing the total number of passengers being carried at any one time.

| | | Yellow Taxi | | | |
|------------|---|-------------|---|---|---|
| | | 1 | 2 | 3 | 4 |
| Black Taxi | 1 | | | | |
| | 2 | | | | |
| | 3 | | | | |
| | 4 | | | 7 | |
| | 5 | | | | |

(2)

(b) What is the probability that, at any one time, the number of passengers being carried is:

(i) less than 5

.....

(2)

(ii) an odd number

.....

(2)

(iii) 2 or 7

.....

(2)

THE END