FELSTED SCHOOL

MATHEMATICS DEPARTMENT

Paper for those entering year 10

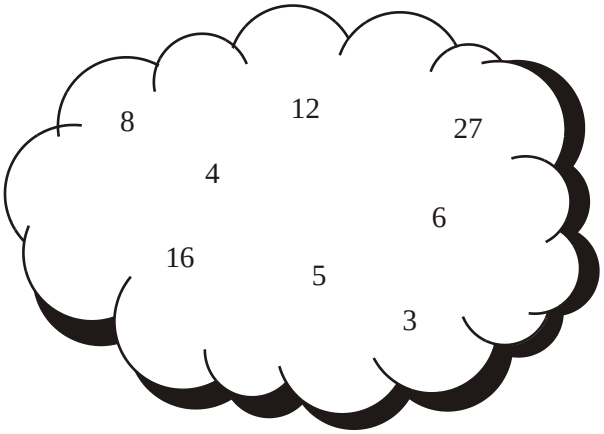
1 hour

- Answer all questions in the spaces provided.
- Show all steps in your working.
- You may use a calculator.
- The total mark for the paper is 60.

Name……

School……

1.



Using only the numbers in the cloud, write down

(i) all the multiples of 6, …….

(ii) all the square numbers, …….

(iii) all the factors of 12, …….

(iv) all the cube numbers. …….

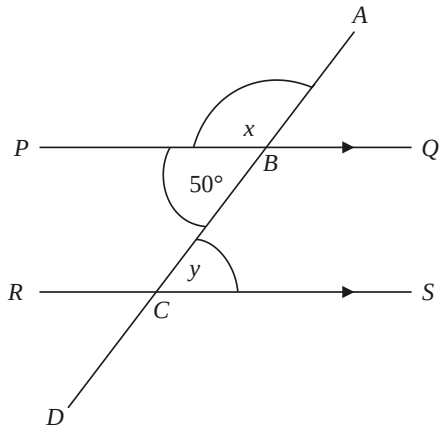
(Total 4 marks)

2. Express 60 as a product of its prime factors.

……..°

(Total 2 marks)

3.



(a) (i) Write down the size of the angle marked *x*.

.....°

(ii) Give a reason for your answer.

.....

.....

(2)

(b) (i) Write down the size of the angle marked *y*.

..... °

(ii) Give a reason for your answer.

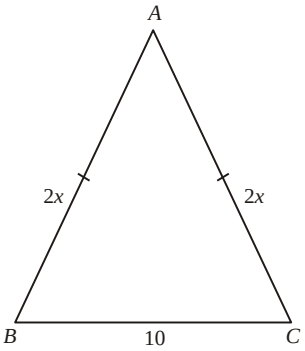
.....

.....

(2)

(Total 4 marks)

4.



In the diagram, all measurements are in centimetres. *ABC* is an isosceles triangle.

(a) Find an expression, in terms of *x*, for the **perimeter** of the triangle.
Simplify your expression.

……

(2)

(b) The perimeter of the triangle is 34 cm. Find the value of x.

$x =$……

(2)
(Total 4 marks)

5. Simplify

(i) $c + c + c + c$

.....

(ii) $p \times p \times p \times p$

.....

(iii) $3g + 5g$

.....

(iv) $2r \times 5p$

.....

(4)
(Total 4 marks)

6. (a) Simplify $4p + 5q + p - 3q$

.....

(2)

(b) Expand $y(y - 5)$

.....

(1)

(c) Expand and simplify $2(3m + 4) + 3(m - 5)$

.....

(2)
(Total 5 marks)

7. The diagram shows a 6-sided shape made from a rectangle and a right-angled triangle.

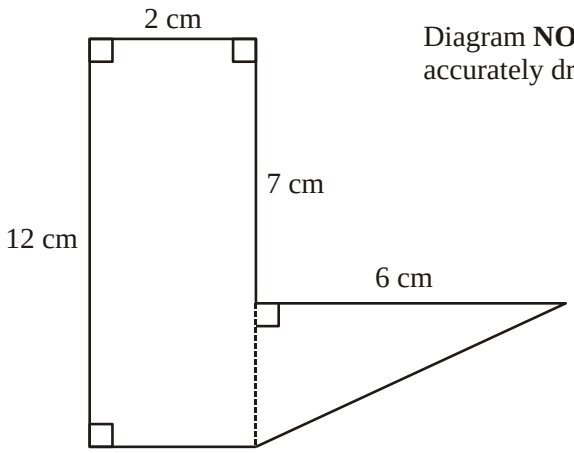


Diagram **NOT** accurately drawn

Work out the total area of the 6-sided shape.

.....cm^2

(Total 3 marks)

8. (a) Without using a calculator, work out $\frac{1}{3}+\frac{3}{5}$. You **must** show all stages of your working.

.....

(2)

(b) Without using a calculator, work out $2\frac{1}{4}\div\frac{3}{5}$. You **must** show all stages of your working.

.....

(3)
(Total 5 marks)

9. (a) Simplify

$x^5 \div x^2$

……

(1)

(b) Simplify

$2w^4y \times 3w^3y^2$

……

(2)
(Total 3 marks)

10. An alloy is made from tin and copper.
The ratio of the weight of tin to the weight of copper is 1 : 4

Sally made 35 grams of the alloy.

Work out the weight of tin she used.

.....g

(2)

(Total 2 marks)

11. (a) Solve $7x + 18 = 74$

$x =$ ……

(2)

(b) Solve $5p + 7 = 3(4 - p)$

$p =$ ……

(3)

(Total 5 marks)

12. Here is a tile in the shape of a semicircle.

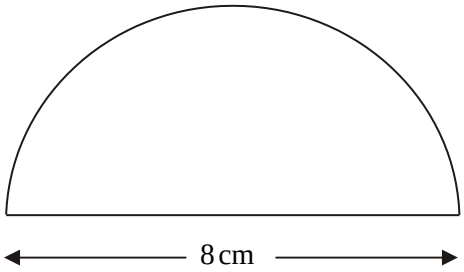


Diagram **NOT** accurately drawn

The diameter of the semicircle is 8 cm.

Work out the perimeter of the tile.
Give your answer correct to 2 decimal places.

..... cm
(Total 3 marks)

13. 20 students scored goals for the school hockey team last month.
The table gives information about the number of goals they scored.

Goals scored	Number of students	
1	9	
2	3	
3	5	
4	3	

(a) Write down the modal number of goals scored.

.....
(1)

(b) Work out the range of the number of goals scored.

.....
(1)

(c) Work out the mean number of goals scored.

.....

(3)

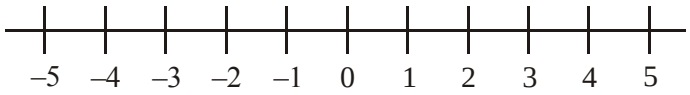
(Total 5 marks)

14. (i) Solve the inequality

$$5x - 7 < 3$$

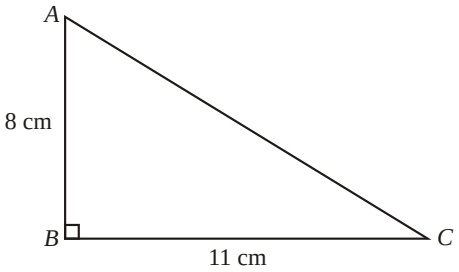
……

(ii) On the number line, represent the solution set to part (i).



(Total 3 marks)

15.



ABC is a right-angled triangle.

AB = 8 cm,
BC = 11 cm.

Calculate the length of *AC*.
Give your answer correct to 3 significant figures.

…… cm

(Total 3 marks)

16. Factorise fully $8x^2 - 12xy$

.....

(Total 2 marks)

17.

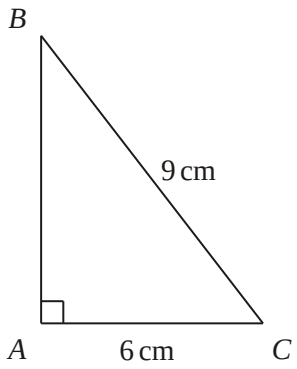


Diagram **NOT** accurately drawn

ABC is a right-angled triangle.

AC = 6 cm.
BC = 9 cm.

Work out the length of *AB*.
Give your answer correct to 3 significant figures.

..... cm

(Total 3 marks)