GRESHAM'S
EST. 1555

MATHEMATICS ENTRANCE EXAM SAMPLE

Year 9

Time allowed: 60 minutes

INSTRUCTIONS TO CANDIDATES

Attempt as many questions as you can

Calculators are permitted

Always make your method clear and show your working

Q1.

(a) Write the following numbers in order of size.
Start with the smallest number.

5 17 2 25 8

.....

(1)

(b) Write the following numbers in order of size.
Start with the smallest number.

–3 0 6 –10 –7

.....

(1)

(Total for Question is 2 marks)

Q2.

(a) Work out $+8 - 6$

.....

(1)

(b) Work out $-5 - 4$

.....

(1)

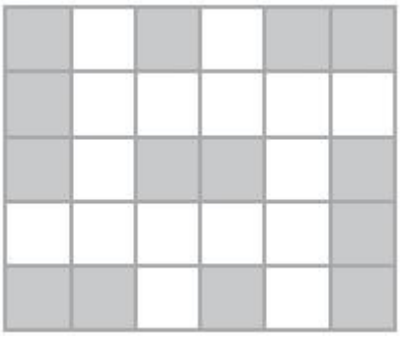
(c) Work out $-12 \div +4$

.....

(1)

(Total for Question is 3 marks)

Q3.



(a) What fraction of this shape is shaded?
Give your answer in its simplest form.

.....

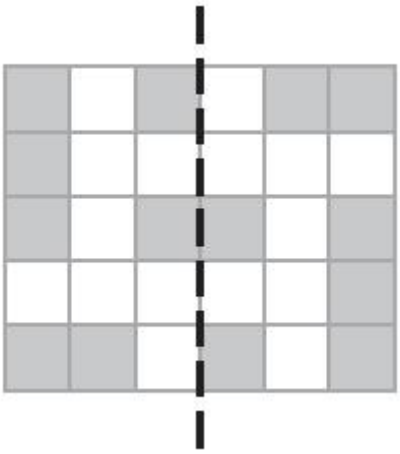
(2)

(b) Write down the order of rotational symmetry of the shape.

.....

(1)

(c) On the shape below, shade as few squares as possible so that the dotted line is a line of symmetry.



(2)

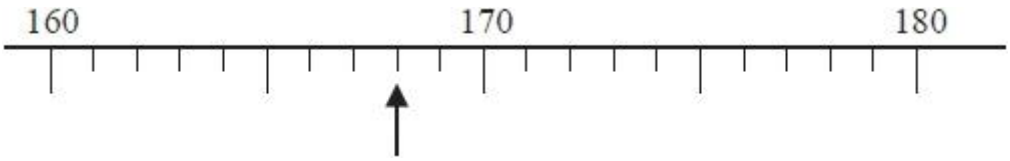
(Total for Question is 5 marks)

Q4.

(a) Write the number 6458 correct to the nearest hundred.

.....

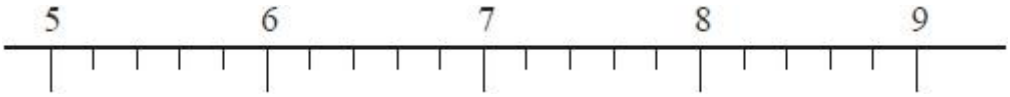
(1)



(b) Write down the number marked by the arrow.

.....

(1)



(c) Find the number 7.2 on the number line above.
Mark the number with an arrow (↑).

(1)

(Total for question = 3 marks)

Q5.

(a) Write 0.7 as a fraction.

.....

(1)

(b) Write 0.3 as a percentage.

.....

(1)

(c) Write $^{8}/_{12}$ in its simplest form.

.....

(1)

(Total for Question is 3 marks)

Q6.

Without using a calculator work out, (you must show your working) 342×24

.....

(Total for Question is 3 marks)

Q7.

Without using a calculator work out, (you must show your working) $3\frac{4}{5} + \frac{3}{7}$

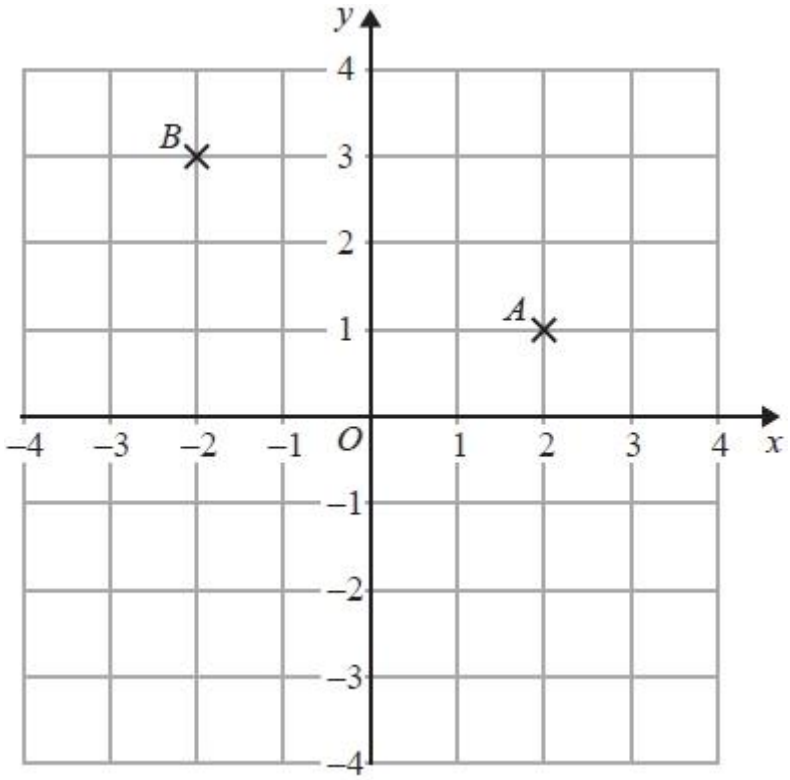
Give your answer as a mixed number in its simplest form.

.....

(Total for question = 3 marks)

Q8.

(i)



(a) Write down the coordinates of the point *A*.

(..... , ...)

(1)

(b) Write down the coordinates of the point *B*.

(..... , ...)

(1)

(c) On the grid, mark with a cross (×) the point (−3, −1).
Label this point *C*.

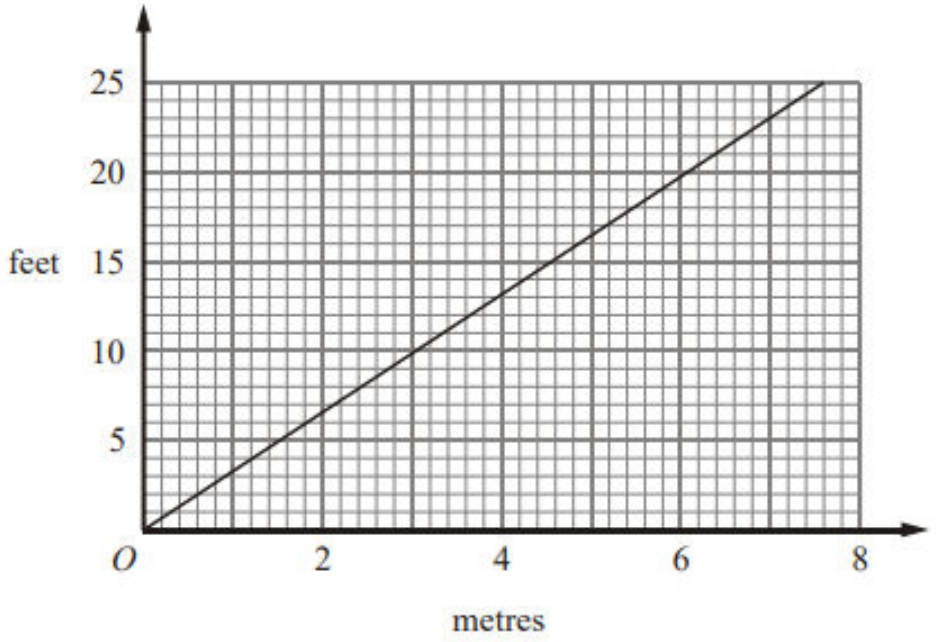
(1)

(d) On the grid, draw the line $x = 3$

(1)

(Total for question = 4 marks)

(ii)



This conversion graph can be used to change between metres and feet.

(a) Use the conversion graph to change 6 metres to feet.

..... feet

(1)

(b) Use the conversion graph to change 8 feet to metres.

..... metres

(1)

Robert jumps 4 metres.
James jumps 12 feet.

(c) (i) Who jumps furthest, Robert or James?

.....

(ii) How did you get your answer?

.....

.....

(2)
(Total 4 marks)

Q9.

Without using a calculator work out, (you must show your working) $3\frac{1}{3} \div 4\frac{3}{4}$

.....

(Total for Question is 2 marks)

Q10.

(a) Solve $4x = 20$

$x =$ . . . . . .

(1)

(b) Solve $y + 5 = 12$

$y =$ . . . . . .

(1)

(Total for Question is 2 marks)

Q11.

(a) Simplify $5x + 4y + x - 7y$

.....

(2)

(b) Solve $7(x + 2) = 7$

.....

(2)

(c) Expand and simplify $11 - 3(x + 2)$

.....

(2)

(d) Simplify $a^5 \times a^4$

.....

(1)

(Total for Question is 7 marks)

Q12.

Lydia is buying a ring.
The ring costs £60
She pays a deposit of 40%.
Work out how much she pays as the deposit.

£. . . . . .

(Total for Question is 2 marks)

Q13.

The table shows information about the numbers of Year 10 students absent from Ellen's school last week.

	Monday	Tuesday	Wednesday	Thursday	Friday
Number of students	12	6	7	10	13

(a) Work out the mean number of Year 10 students absent each day.

.....

(2)

Ellen's school has a total of 240 Year 10 students.

(b) What percentage of Year 10 students were absent on Monday?

..... %

(2)

(Total for question = 4 marks)

Q14.

Here is a list of numbers.

5 15 30 50 60 90 100 125

From the numbers in the list, write down

(i) two different numbers that add up to an even number

.....

(ii) a multiple of 20

.....

(iii) a factor of 45

.....

(iv) a cube number

.....

(Total for Question is 4 marks)

Q15.

Stephanie thinks of a positive number.
She squares the number and adds 7
The result is 43

What number did Stephanie think of?

.....

(Total for question = 3 marks)

Q16.

(a) Factorise completely $t^2 + 6t$

.....

(2)

(b) Factorise completely $12\ x^3y - 18\ xy^2$

.....

(2)

(c) Simplify $5x^4y^3 \times 2x^3y^2$

.....

(2)

(Total for Question is 6 marks)

Q17.

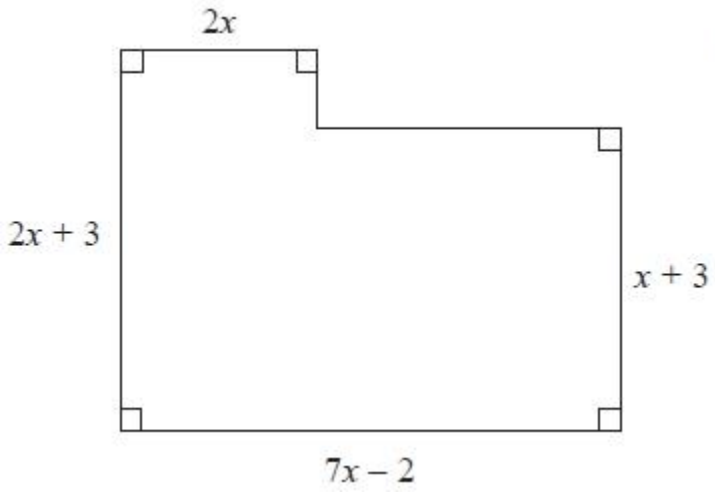


Diagram **NOT** accurately drawn

All the measurements in the diagram are in centimetres.

(a) Given $x = 2$, mark on the diagram the lengths of all the sides.

(b) Calculate the area of the shape.

.....

(Total for question = 4 marks)

Q18.

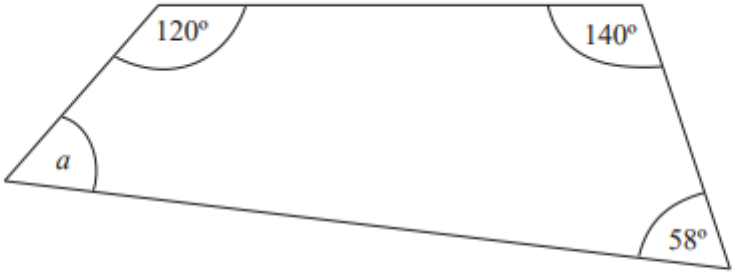


Diagram **NOT** accurately drawn

Work out the size of the angle a.

.....°

(Total for Question is 2 marks)

Q19.

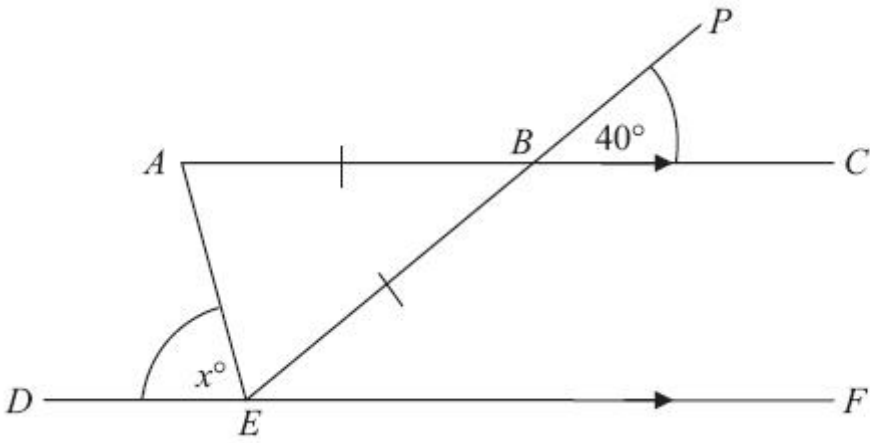


Diagram **NOT** accurately drawn

ABC is parallel to DEF.
EBP is a straight line.
$AB = EB$.
Angle $PBC = 40°$.
Angle $AED = x°$.

Work out the value of x.
Give a reason for each stage of your working.

(Total for Question is 5 marks)

Q20.

The diagram shows the floor plan of Mary's conservatory.

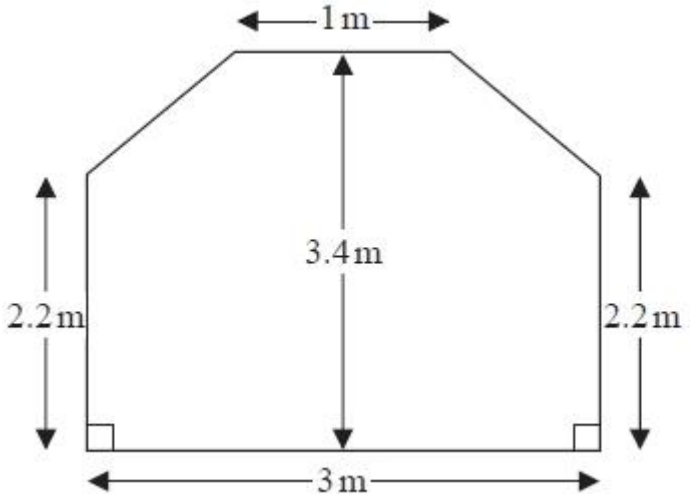


Diagram **NOT** accurately drawn

Mary is going to cover the floor with tiles.

The tiles are sold in packs.
One pack of tiles will cover $2m^2$
A pack of tiles normally costs £24.80
Mary gets a discount of 25% off the cost of the tiles.

Mary has £100

Does Mary have enough money to buy all the tiles she needs?
You must show all your working.

(Total for question = 5 marks)

Q21.

The diagram shows a rectangular framework.

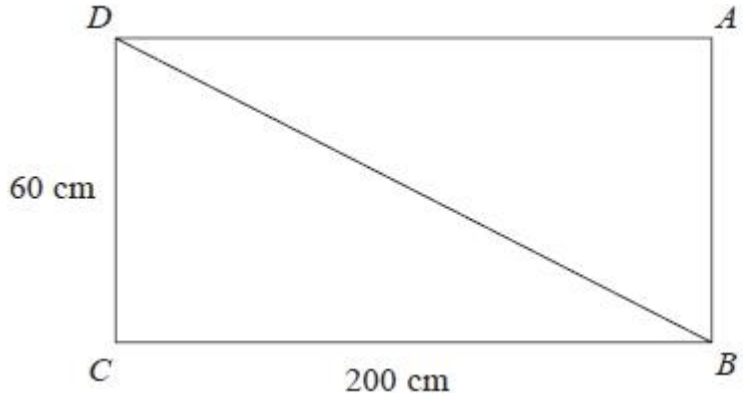


Diagram **NOT** accurately drawn

The framework is made from 5 metal rods.
The metal rods have a weight of 0.9 kg per metre.

Work out the total weight of the framework.
Give your answer, in kg, correct to 3 significant figures.

..... kg

(Total for question = 4 marks)