GRESHAM'S

MATHEMATICS ENTRANCE EXAM

Year 9 Entry

Time allowed: 90 minutes

INSTRUCTIONS TO CANDIDATES

- Write your name in the space provided
- Calculators are permitted
- Always make your method clear and show your working
- Answer all questions
- Show units where applicable and give answers to 3 significant figures unless otherwise stated

CANDIDATE NAME: _____

SCORE: _____ PERCENTAGE: _____

1. (a) Use your calculator to work out

$$(2.3 + 1.8)^2 \times 1.07$$

Write down all the figures on your calculator display.

.....

(2)

(b) Put brackets in the expression below so that its value is 45.024

1.6 + 3.8 × 2.4 × 4.2

(1)
(Total 3 marks)

2.

$$D = ut + kt^2$$

$u = 20$
$t = 1.2$
$k = -5$

(a) Work out the value of D.

.....

(2)

$D = 50$
$t = 5$
$k = -5$

(b) Work out the value of u.

.....

(2)

(c) Make u the subject of the formula

$$D = ut + kt^2$$

$u =$ .....

(2)
(Total 6 marks)

3. Use your calculator to work out the value of

$$\frac{(7.91-\sqrt[3]{81})\times 4.32}{6.23+1.491}$$

Give your answer correct to 3 significant figures.

.....

(Total 3 marks)

4. Simplify

(i) $p^2 \times p^7$

.....

(ii) $x^8 \div x^3$

.....

(Total 2 marks)

5. (a) Work out $\frac{2}{5}+\frac{3}{8}$

.....

(2)

(b) Work out $5\frac{2}{3} - 2\frac{3}{4}$

.....

(3)

(Total 5 marks)

6. This is a list of ingredients for making a pear & almond crumble for 4 people.

Ingredients for **4** people.
80 g plain flour
60 g ground almonds
90 g soft brown sugar
60 g butter
4 ripe pears

Work out the amount of each ingredient needed to make a pear & almond crumble for **10** people.

..... g plain flour

..... g ground almonds

..... g soft brown sugar

..... g butter

..... ripe pears

(Total 3 marks)

7. Richard has a box of toy cars.
Each car is red or blue or white.

3 of the cars are red.
4 of the cars are blue.
2 of the cars are white.

Richard chooses one car at random from the box.

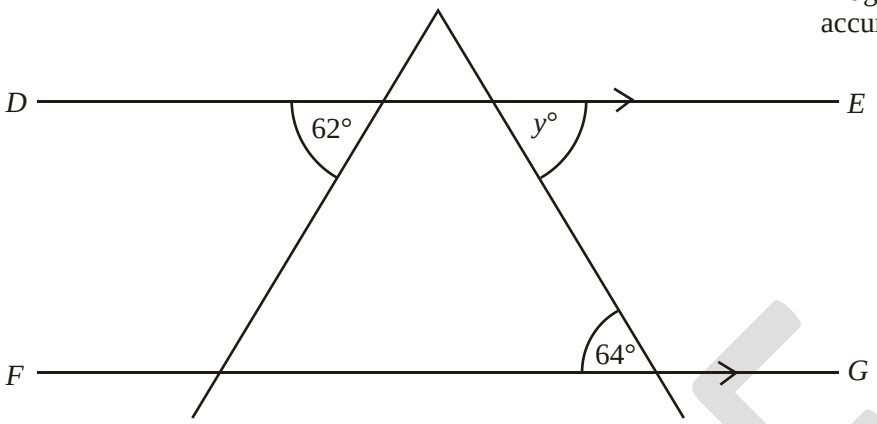
Write down the probability that Richard will choose a blue car.

.....

(Total 2 marks)

8.

Diagram **NOT** accurately drawn



DE is parallel to *FG.*
Find the size of the angle marked *y*°.

.....°

(Total 2 mark)

9. Michael buys 3 files

The total cost of these 3 files is £5.40
Work out the total cost of 7 of these files.

£.....

(Total 3 marks)

10. (a) Simplify

(i) $3g + 5g$

.....

(ii) $2r \times 5p$

.....

(2)

(b) Expand $5(2y - 3)$

.....

(1)

(c) Expand and simplify

$2(3x + 4) - 3(4x - 5)$

.....

(2)

(Total 5 marks)

11. 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)

12. Lily said, "When $x = 3$, then the value of $4x^2$ is 144".

Tom said, "When $x = 3$, then the value of $4x^2$ is 36".

(a) Who was right?

Explain why.

(2)

(b) Work out the value of $4(x + 1)^2$ when $x = 3$.

.....

(1)
(Total 3 marks)

13.

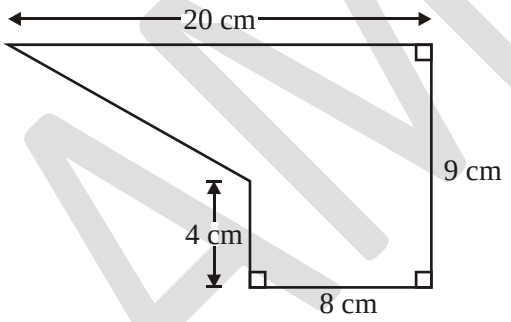


Diagram **NOT** accurately drawn

The diagram shows a shape.
Work out the area of the shape.

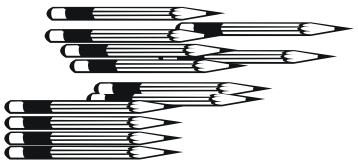
..... cm^2

(Total 4 marks)

14. Lisa packs pencils in boxes.

She packs 12 pencils in each box.

Lisa packs *x* boxes of pencils.



(a) Write an expression, in terms of *x*, for the number of pencils Lisa packs.

.....

(1)

Lisa also packs pens in boxes.

She packs 10 pens into each box.

Lisa packs *y* boxes of pens.

(b) Write down an expression, in terms of *x* and *y*, for the **total** number of pens and pencils Lisa packs.

.....

(2)
(Total 3 marks)

15. (a) Express 120 as the product of powers of its prime factors.

.....

(3)

(b) Find the Lowest Common Multiple of 120 and 150.

.....

(2)
(Total 5 marks)

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

x = ...

(2)

(b) Solve $4(2y – 5) = 32$

y = ...

(2)

(c) Solve $5p + 7 = 3(4 – p)$

p = ...

(3)

(Total 7 marks)

17. Simon spent $\frac{1}{3}$ of his pocket money on a computer game.

He spent $\frac{1}{4}$ of his pocket money on a ticket for a football match.

Work out the fraction of his pocket money that he had left.

.....

(Total 3 marks)

18. The top of a table is a circle.
The radius of the top of the table is 50 cm.

(a) Work out the area of the top of the table.

……cm^2

(2)

The base of the table is a circle.
The diameter of the base of the table is 40 cm.

(b) Work out the circumference of the base of the table.

……cm

(2)

(Total 4 marks)

19. A school snack bar offers a choice of four snacks.
The four snacks are burgers, pizza, pasta and salad.
Students can choose **one** of these four snacks.

The table shows the probability that a student will choose burger or pizza or salad.

Snack	burger	pizza	pasta	salad
Probability	0.35	0.15		0.2

300 students used the snack bar on Tuesday.

Work out an estimate for the number of students who chose pizza.

.....

(Total 2 marks)

20.

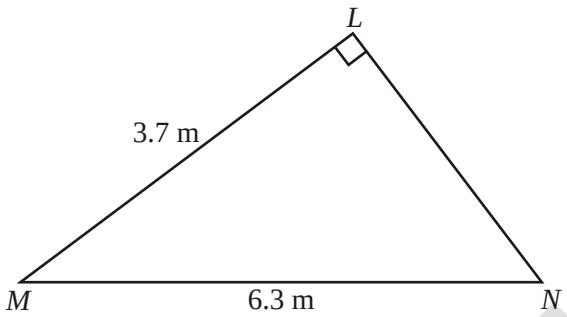


Diagram **NOT** accurately drawn

Angle *MLN* = 90°.
LM = 3.7 m.
MN = 6.3 m.

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

LN = ... m

(Total 3 marks)

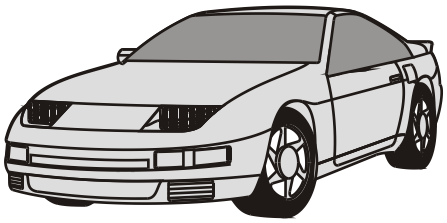
21. Isabel thinks of a number.
When she multiplies her number by 5 and subtracts 16 from the result, she gets the same answer as when she adds 10 to her number and multiplies that result by 3.

Find the number Isabel is thinking of.

.....

(Total 4 marks)

22. Sam bought a car for £12 000.



Each year the value of the car depreciated by 10%.

Work out the value of the car two years after he bought it.

£ .....

(Total 3 marks)

END OF TEST

Total marks [80]