Name: $\qquad$ Class: $\qquad$ Mark

## INSTRUCTIONS TO CANDIDATES

- Answer all questions. There are 20 questions to answer.
- Each question carries 1 mark.
- Calculators and protractors are not allowed.
- You are not required to show your working. However space for working is provided if you need it.

| No. | Question | Space for Worki |
| :---: | :---: | :---: |
| 1 | Each exterior angle of a regular polygon is $24^{\circ}$. How many sides has the polygon? <br> Answer: |  |
| 2 | Write 2300000 in standard form. <br> Answer: $\qquad$ |  |
| 3 |  <br> Write down the gradient of the line. <br> Answer: $\qquad$ |  |
| 4 | Given that $f(x)=2 x-8$, write down the value of $f(3)$. <br> Answer: $\qquad$ |  |
| 5 | Lawrence invests $€ 3500$ in a bank at $4 \%$ per annum. Find the interest that Lawrence receives from the bank after one year. <br> Answer: € $\qquad$ |  |
| 6 | O is the centre of the circle and POR is a straight line. Find the size of angle PRQ. <br> Answer: $\qquad$ |  |
| 7 | How many hours are there from 1900 hours on Monday to 0800 hours on Wednesday of the same week? <br> Answer: $\qquad$ hours |  |


| No. | Question | Space for Wor |
| :---: | :---: | :---: |
| 8 | Three athletes run a marathon in: <br> 2 hours 37 minutes, 3 hours 23 minutes and 3 hours. What is the average time taken by the athletes? <br> Answer: $\qquad$ |  |
| 9 | Find the length of $\mathbf{B C}$. <br> Answer: $\qquad$ cm |  |
| 10 | There are 150 students in a hall sitting for an examination. Each student requires 8 foolscaps. Each sealed packet of foolscaps contains 500 foolscaps. How many packets of foolscaps are needed? <br> Answer: $\qquad$ packets |  |
| 11 | In a survey at an airport it was found that $\frac{1}{8}$ of the flights arrived early, $\frac{5}{8}$ of the flights arrived on time and the remainder arrived late. What fraction of the flights arrived late? <br> Answer: |  |
| 12 | Sarah buys three different kinds of postage stamps: <br> She buys 80 of each kind. <br> How much does she spend? <br> Answer: $€$ |  |
| 13 | The pie chart shows the results of a survey of 720 children about their favourite fast foods. <br> How many children chose chicken nuggets? <br> Answer: $\qquad$ |  |


| No. | Question | Space for Worn |
| :---: | :---: | :---: |
| 14 | Given that $a=\frac{3}{4}$ and $b=\frac{3}{2}$, find the value of $\frac{1}{a}+\frac{1}{b}$. <br> Answer: $\qquad$ |  |
| 15 | Given that $\tan x^{\circ}=\frac{1}{3}$, find the length of $\mathbf{Q R}$. <br> Answer: $\qquad$ cm |  |
| 16 | The graph shows the journey of a cyclist. <br> Write down the speed of the cyclist in $\mathbf{k m} / \mathbf{h}$. <br> Answer: $\qquad$ km/h |  |
| 17 | A man earns $€ 13400$ and is allowed $€ 11400$ free of tax. He pays a tax of $\mathbf{1 5 \%}$ on the remainder. How much tax does he pay? <br> Answer: € $\qquad$ |  |
| 18 | Work out $4-\left(\frac{2}{9}+\frac{2}{3}\right)$, giving your answer as a mixed number. <br> Answer: $\qquad$ |  |
| 19 | The sum of three consecutive numbers is $3 x+51$. Which one of the following is the largest number? <br> A) $x+16$ <br> B) $x+17$ <br> C) $x+18$ <br> D) $x+19$ <br> Answer: $\qquad$ |  |
| 20 | Make $\boldsymbol{y}$ the subject of the formula $\boldsymbol{x}=\sqrt{\frac{y}{18}}$. <br> Answer: $\qquad$ |  | Main Paper


| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | NC | Main | Global |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

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DO NOT WRITE ABOVE THIS LINE

CALCULATORS ARE ALLOWED BUT ALL NECESSARY WORKING MUST BE SHOWN. ANSWER ALL QUESTIONS.

1. (a) The price for accommodation at a hotel in Spain is $€ 116.25$, not including $7 \%$ VAT. Work out the total amount paid including VAT.
Give your answer correct to the nearest cent.

Total amount including VAT $=€$ $\qquad$
(b) Another hotel quotes a total price of $€ 149.80$, including $7 \%$ VAT. Work out the price of accommodation before VAT was included.

Price before VAT was included $=€$ $\qquad$
2. Solve the equation $\frac{2 x-3}{3}-\frac{x}{4}=\frac{1}{2}$.

$$
x=
$$

$\qquad$
3. The figure shows a cylinder closed at both ends and its net.

(a) Show that the total surface area, $\boldsymbol{S}$, of the cylinder is: $\boldsymbol{S}=\mathbf{2} \pi \boldsymbol{r}(\boldsymbol{r}+\boldsymbol{h})$.
(b) Work out the total surface area when $r=4 \mathrm{~cm}$ and $h=10 \mathrm{~cm}$. Give your answer correct to three significant figures.

Total surface area $=$ $\qquad$ $\mathrm{cm}^{2}$
(c) Make $\boldsymbol{h}$ the subject of the formula given in (a).

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4. (a)


Figure 1

## In Figure 1:

(i) Triangles ABC and ADC can be proved to be congruent. Underline the correct reason.

$$
\text { SAS } \quad \text { RHS } \quad \text { SSS } \quad \text { ASA }
$$

(ii) Complete the following statement: Since triangles ABC and ADC are congruent

$$
\angle \mathrm{BAC}=\angle
$$

(b)


In Figure 2 the diagonals AC and BD are drawn to meet at X .
(i) Prove that triangles ABX and ADX are congruent, giving reasons for your answers.
(ii) Explain why AC and BD are perpendicular.
5. Complete the set of LOGO commands given to the turtle to draw the isosceles trapezium $A B C D$.
The turtle started at the point A as shown.


PD RT $\qquad$ FD 70 RT $\qquad$ FD 120 RT $\qquad$ FD $\qquad$ HOME
6.


NO marks will be awarded unless ALL working is shown.
(a) Show that $\mathrm{BX}=5.88 \mathrm{~m}$, correct to the nearest $\mathbf{c m}$.
(b) (i) Explain why $\angle \mathrm{ADB}=26^{\circ}$.
(ii) Hence work out the length of BD , correct to the nearest $\mathbf{c m}$.

$$
\mathbf{B D}=
$$

$\qquad$ m
(c) Work out the height of the building, CD , correct to the nearest $\mathbf{c m}$.

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7. Use ruler and compasses only to answer this question. All construction lines and ares must be clearly shown.
(a) Construct accurately the triangle PQR , sketched on the right.

(b) Construct the perpendicular height, $h$, from P to QR .
(c) Measure and write down the length of the perpendicular height, $h$, correct to the nearest cm.
$h=$ $\qquad$ cm
8. A DVD shop has a special offer on the sale of DVD's and video games.

Any 2 DVD’s +3 video games for $€ 42$

Any 4 DVD's + 1 video game for $€ 39$


Use $\boldsymbol{d}$ to represent the cost of 1 DVD and $\boldsymbol{v}$ to represent the cost of 1 video game, in euro.
(a) Use the information shown above to write down two equations in $\boldsymbol{d}$ and $\boldsymbol{v}$.
(b) Solve your equations simultaneously to find the cost of 1 DVD and 1 video game during the special offer. Show ALL your working.

1 DVD costs $€$ $\qquad$
1 Video game costs $€$ $\qquad$
9. A small factory employs 30 workers. The table below gives the number of days off, due to illness, of the workers during one month.
Two of the workers were in hospital for most of the month.

| Number of days off due to illness | 0 | 1 | 2 | 3 | 4 | 6 | 18 | 19 |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Number of workers | 10 | 7 | 1 | 2 | 5 | 3 | 1 | 1 |

(a) Write down the modal number of days off.
(b) Find the median number of days off.
(c) Work out the mean number of days off.

Mean number of days off: $\qquad$ days
(d) Which average, the median or the mean, do you think describes the data better?

Explain your answer.
10. (a) Below is a description in words of the connection between the $y$-value a $x$-value when points are plotted on a grid.
"The $y$-value is found by doubling the $x$-value and then adding three".
Write down an equation for this description in terms of $\boldsymbol{x}$ and $\boldsymbol{y}$.

$$
y=
$$

$\qquad$
(b) The table below gives $x$ - and $y$ - values for a set of points.
(i) Fill in the blanks to complete a description in words of the connection between the $x$ - and $y$ - values.

| $x$ | -1 | 0 | 1 | 2 |
| :--- | :--- | :--- | :--- | :--- |
| $y$ | -5 | -2 | 1 | 4 |

"The $y$-value is found by multiplying the $x$-value by $\qquad$ then subtracting $\qquad$ $"$.
(ii) Write down an equation for the connection between the $x$ - and $y$-values given in the table, in terms of $\boldsymbol{x}$ and $\boldsymbol{y}$.

$$
y=
$$

$\qquad$
(iii) Use the $x$ - and $y$ - values given in the table to draw the graph of the equation.
(iv) A line passes through ( $\mathbf{0}, \mathbf{2}$ ). This line is parallel to the line drawn.
Write down the equation of the line


Equation of line: $\qquad$
11. (a) Draw the image of triangle $\mathbf{P}$ after reflection in the line $y=-x$. Label the image $\mathbf{Q}$.
(b) Describe fully the single transformation that maps triangle $\mathbf{P}$ to triangle $\mathbf{R}$.
(c) Draw the image of triangle $\mathbf{P}$ after an enlargement scale factor 2 with centre $(0,0)$. Label the image $\mathbf{S}$.

12. The diagram shows a rectangle formed by using a wall for one side and a rop 24 m for the other three sides.

(a) Show that the area, $\boldsymbol{A}$, of the rectangle is given by $\boldsymbol{A}=\mathbf{2 4 x} \boldsymbol{- 2 \boldsymbol { x }}$.
(b) The table shows values of $x$ from 1 to 11 for $A=24 x-2 x^{2}$.

Complete the table.

| $x$ | 1 | 3 | 5 | 7 | 9 | 11 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $24 x$ | 24 |  | 120 |  |  | 264 |
| $-2 x^{2}$ | -2 |  | -50 |  |  | -242 |
| $A$ | 22 |  | 70 |  |  | 22 |

(c) Use the values of $x$ and $A$ in the table to draw the graph of $A=24 x-2 x^{2}$.

(d) On your graph mark with a $\times$ the point which shows where the greatest area of the rectangle occurs and write down the greatest value of the area.

Greatest area = $\qquad$ $\mathrm{m}^{2}$
13. $\mathrm{P}, \mathrm{Q}, \mathrm{R}$ and S are four points on the circumference of a circle centre O .

TP and TR are tangents to the circle at P and R .
$\mathrm{TP}=\mathrm{TR}$.
Angle PTR $=76^{\circ}$.


Work out the size of the following angles.
Show all your working and give reasons for your answers.
(a) $\angle \mathrm{PRT}$
(b) $\angle \mathrm{POR}$
(c) $\angle \mathrm{PQR}$
(d) $\angle \mathrm{PSR}$

## END OF PAPER

