Answer ALL TWENTY FOUR questions.
Write your answers in the spaces provided.
You must write down all stages in your working.

1. Here are the first five terms in a number sequence.

15
5
9
13
17
21
Find the 10 th term in this number sequence.

$$
4 n+1
$$

$$
n=10
$$

$40+1$
$\qquad$
2. A rugby team played six games.

The mean score for the six games is 14.5
The rugby team played one more game.
The mean score for all seven games is 16
Work out the number of points the team scored in the seventh game.

3. Rosie and Jim are going on holiday to the USA.

Jim changes $£ 350$ into dollars (\$).
The exchange rate is $£ 1=\$ 1.34$
(a) Work out how many dollars (\$) Jim gets.
$350 \times 1.34$

In the USA Rosie sees some jeans costing \$67
In London the same make of jeans costs $£ 47.50$
The exchange rate is still $£ 1=\$ 1.34$


(b) Work out the difference between the cost of the jeans in the USA and in London. Give your answer in pounds (£).

$$
\begin{aligned}
67 \div 1.34 & = \pm 50 \\
& \neq 47.50
\end{aligned}
$$

4. John needs 4 tyres for his car.

He pays for 3 tyres and gets one tyre free. The tyres cost $£ 65$ each plus VAT at $20 \%$.

Work out how much in total John pays for the tyres.
Offer of the week
4 for the price of 3


$$
3 \times 765=k 195
$$

$$
207=\text { E } 39^{+}
$$


(Total 4 marks)
5. (a) Use your calculator to work out $\frac{\sqrt{2.5^{2}+3.75}}{3.9-1.7}$

Write down all the figures on your calculator display. You must give your answer as a decimal.
(b) Write your answer to part (a) correct to 2 decimal places.
6. The equation $x^{3}+3 x=41$
has a solution between 3 and 4
Use a trial and improvement method to find this solution.
Give your answer correct to one decimal place.
You must show all your working.

$$
\begin{aligned}
& x=3 \rightarrow 36 \\
& x=4 \rightarrow 76 \\
& x=3.1 \rightarrow 39.1 \\
& x=3.2 \rightarrow 42.4 \\
& x=3.15 \rightarrow 40.7 \quad \text { (too low) } \\
& x=3.2
\end{aligned}
$$



Diagram NOT
accurately drawn
$P Q R$ is a right-angled triangle.
$P Q=16 \mathrm{~cm}$.
$P R=8 \mathrm{~cm}$.
Calculate the length of $Q R$.
Give your answer correct to 2 decimal places.

$$
\sqrt{16^{2}-8^{2}}
$$

8. (a) Simplify $x^{5} \times x^{4}$
(b) Simplify $y^{7} \div y^{2}$
(c) Expand and simplify $3(2 a+5)+5(a-2)$

$$
\begin{align*}
& 6 a+15 \\
& 5 a-10  \tag{2}\\
& \hline
\end{align*}
$$

$$
11 a+5
$$

(d) Expand and simplify $(y+5)(y+7)$

$$
\begin{equation*}
y^{2}+12 y+35 \tag{2}
\end{equation*}
$$

(e) Factorise

$$
p^{2}-6 p+8
$$

$$
(p-4)(p-2)
$$

9. Riki has a packet of flower seeds.

The table shows each of the probabilities that a seed taken at random will grow into a flower that is pink or red or blue or yellow.

| Colour | pink | red | blue | yellow | white |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Probability | 0.15 | 0.25 | 0.20 | 0.16 |  |

(a) Work out the probability that a seed taken at random will grow into a white flower.

$$
1-0.15-0.25-0.20-0.16
$$

There are 300 seeds in the packet.
All of the seeds grow into flowers.
(b) Work out an estimate for the number of red flowers.
0.25
10. Caleb measured the heights of 30 plants.

The table gives some information about the heights, $h \mathrm{~cm}$, of the plants.

| Height $(h \mathrm{~cm})$ of plants | Frequency | $m v$ | $m v \times f$ |
| :---: | :---: | :---: | :---: |
| $0<h \leqslant 10$ | 2 | 5 | 10 |
| $10<h \leqslant 20$ | 8 | 15 | 120 |
| $20<h \leqslant 30$ | 9 | 25 | 225 |
| $30<h \leqslant 40$ | 7 | 35 | 245 |
| $40<h \leqslant 50$ | 4 | 45 | 180 |

Work out an estimate for the mean height of a plant.

11. (a) On the number line below, show the inequality $-2<y<3$

(b) Here is an inequality, in $x$, shown on a number line.


Write down the inequality.
(c) Solve the inequality $4 t-5>9$

$$
4 t>14
$$

$$
\begin{equation*}
t>3.5 \tag{2}
\end{equation*}
$$

12. Sylvie shares $£ 45$ between Ann, Bob and Cath in the ratio $2: 3: 4$

Work out the amount each person gets.

(Total 3 marks)
13. $A B C D$ is a trapezium.


Diagram NOT accurately drawn

Work out the area of the trapezium.


(Total 2 marks)
14. $P Q R$ is a right-angled triangle.

(a) Find the size of the angle marked $x$.

Give your answer correct to 1 decimal place.

$$
x=\tan ^{-1}\left(\frac{8}{12}\right)
$$

$X Y Z$ is a different right-angled triangle.

$X Y=5 \mathrm{~cm}$.
Angle $Z=32^{\circ}$.

(b) Calculate the length $Y Z$.

Give your answer correct to 3 significant figures.

$$
y z=\frac{5}{\sin 32}
$$

Diagram NOT
accurately drawn

