**Perth Academy National 5 Expressions and Formulae Homework 4N**

1. Do these without a calculator. Show all working.

   (a) $2\frac{1}{2} \times 1\frac{1}{3}$ (b) $0 \cdot 6 \div 0 \cdot 2$ (c) $1\frac{1}{5} \div 1\frac{1}{2}$

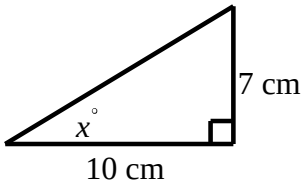
2. (a) Out of 173 pupils in S1, 23 are absent. What percentage is this?
   (b) A car dealer buys a car for £8500 and sells it for £9250.
   Express his profit as a percentage of the cost price.

3. The results of a survey on travel to school are shown below.
   Draw an appropriate statistical diagram to illustrate this information.

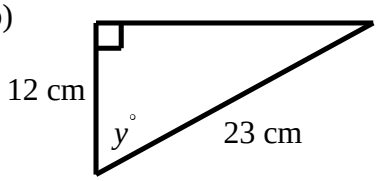
| | |
|---|---|
| Walk | 10 |
| Bus | 8 |
| Car | 5 |
| Cycle | 3 |

4. In each of the following triangles find the size of the indicated angle.

   (a)




   (b)




5. Find the mean, mode and median of: 13, 17, 14, 21, 14, 19, 20, 19, 14.

6. The price of an item, including 40% profit, is £980. Find the cost before the profit is added.

7. On a £500 holiday a company offers an easy payment scheme.
   £100 is repaid on the 15th of each month.
   Interest is charged at a rate of $2 \cdot 5\%$ per month on the amount outstanding at the end of each month.
   The first payment is to be made in May.
   Find the amount outstanding at the beginning of August.

8. A satellite completes an orbit of length $2 \cdot 6 \times 10^4$ miles in $9 \cdot 2 \times 10^{-1}$ hours.
   Calculate its average speed, giving your answer in standard form, correct to 2 significant figures.

9. (a) A rectangle has area $24\,cm^2$ and length $10\,cm$. Calculate its breadth.
   (b) A rectangle has area $1\frac{7}{8}\,cm^2$ and length $1\frac{1}{2}\,cm$. Calculate its breadth.

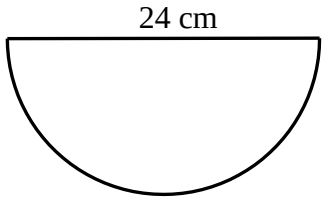
10. Do each of these percentage calculations without a calculator. Show your calculations.

    (a) 15% of £66 (b) 7% of £132 (c) 17½% of £160

11. Solve the following equations:

(a) $3\ 2x+1\ =4x+17$ (b) $4(1-x)=x-6$

12. This semicircle has diameter 24 cm.




(a) Calculate the perimeter of the shape.

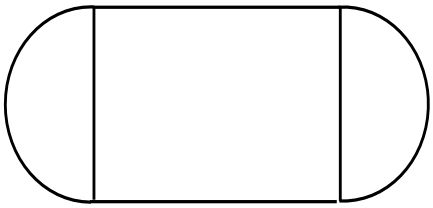
(b) Calculate the area of the shape.

13. Rhombus ABCD has diagonal, AC, measuring $16\,\text{cm}$ and shorter diagonal, BD, measuring $12\,\text{cm}$.

(a) Draw a sketch of rhombus ABCD.
(b) Calculate the area of rhombus ABCD.
(c) Calculate the length of a side, and hence the perimeter of the rhombus ABCD.

14. (a) How many 2cm wooden cubes can be fitted into a cubic box of edge 10cm?
(b) How many 2cm wooden cubes can be fitted into a cubic box of edge 5cm?

15. The sports field sketched here consists of a rectangle with semi-circular ends.
The rectangle has length 100m and breadth 70m.



(a) Calculate the perimeter of the field.

(b) Calculate the area of the field.