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

1. Calculate the average speed for each of these journeys. Give your answers in kilometers per hour.

   (a) 350 km in 5 hours.
   (b) 60 km in 35 minutes.
   (c) 134 km in 1 hour 27 minutes.

2. Calculate the distance travelled for each of these journeys. Give your answers in kilometers.

   (a) 20 minute journey at an average speed of 50 km/hr.
   (b) 1 hour 40 minute journey at an average speed of 36 km/hr.
   (c) 2 hour 27 minute journey at an average speed of 72 km/hr.

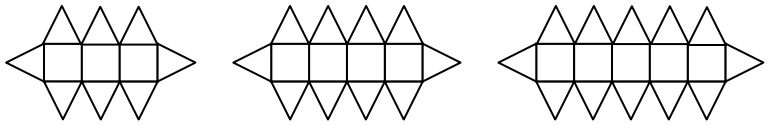
3. Calculate the time taken for each of these journeys. Give your answers in hours and minutes.

   (a) 385 km at an average speed of 70 km/hr.
   (b) 120 km at an average speed of 48 km/hr.
   (c) 100 km at an average speed of 60 km/hr.

4. (a) The price of an item including $17\frac{1}{2}\%$ VAT is £705. Calculate the price before VAT is added.
   (b) After a 30% reduction the selling price of an item is £455. Calculate the price before the reduction.

5. Write down all of the (positive) factors of 120.

6. A circle has circumference 392cm. Find its radius, and hence its area.

7. 

   The figures above are made of squares and triangles.

   (a) Make a table to show the number of squares and triangles in each figure.
   (b) Another figure has 24 squares. How many triangles does it have?
   (c) How many triangles T, would be needed for S squares in this pattern?

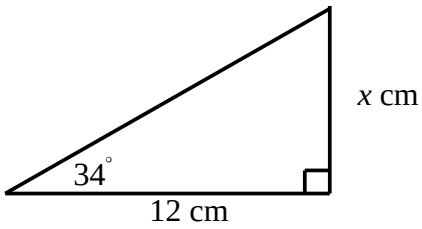
8. Without the use of a calculator, and showing all working, evaluate:

   (a) $1\frac{1}{3}+2\frac{3}{4}$ (b) $2\frac{1}{4}\times 1\frac{1}{3}$ (c) $6\div\frac{2}{3}$

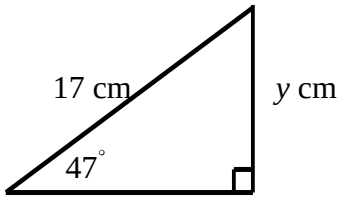
9. A ship steams due west for 1 hour at a speed of 20 km/hr. It then changes course and steams due south for 1 hour at a speed of 24 km/hr.
   Calculate its direct distance from its starting point.

10. Calculate the length of the unknown side in each of these triangles.

(a)




(b)




11. (a) Find the value of $xy^2$ when $x = 4$ and $y = -3$.

(b) Evaluate $\frac{1}{a} - \frac{1}{b}$ when $a = 5$ and $b = 6$.

12. The surface area of a cylinder is given by the formula $A = 2\pi r\ r + h$ , where $r$ is the radius and $h$ is the height.
A cylindrical tank has radius 3 metres and height 11 metres. Calculate its surface area.

13. An equilateral triangle has sides of length 12 cm.
Calculate its altitude, and hence its area.

14. Without using a calculator, calculate each of the following. Show all your working.

(a) $17\frac{1}{2}\%$ of £240

(b) $12\frac{1}{2}\%$ of £450