Perth Academy National 5 Expressions and Formulae Homework 2N

1. Evaluate, without a calculator:

   (a) $\frac{2}{5}$ of $3\frac{1}{2}$ (b) $1-\frac{17}{20}$ (c) $3\frac{5}{7}-2\frac{1}{2}$

2. Solve, leaving your answer as a fraction:

   (a) $3x+1=11$ (b) $4\ x-2\ =15$ (c) $5x-3=10-2x$

3. A survey of how pupils travelled to school revealed 8 walking, 10 by bus, 7 cycling and 4 by car. Show this information in an appropriate statistical diagram.

4. A rhombus has diagonals measuring 24 cm and 12 cm.

   (a) Draw a sketch of the rhombus.
   (b) Calculate its area.
   (c) By using P.T. on a suitable right-angled triangle, calculate the perimeter of the rhombus.

5. A rectangle has length $2x+5$ cm and breadth $2x-3$ cm.

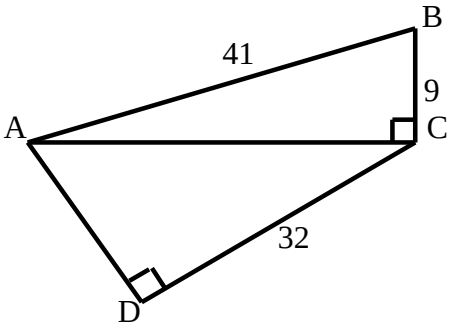
   (a) Find an expression for its perimeter P in terms of x.
   (b) Given that the perimeter is 68 cm, find the value of x.

6. (a) Plot the points $A\ 3,1\ ,\ B\ 7,4\ $ and $C\ 4,8\ .$ Join them to make triangle ABC.
   (b) Use P.T. to determine the length of each side, leaving your answer as a square root, if necessary.

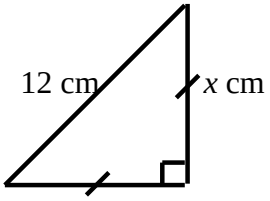
7. Calculate the average speed for the following journeys:

   (a) 84 km in 6 hrs (b) 35 km in 1 hr 15 min (answer in km/hr)
   (c) $3\cdot 2\times 10^{3}$ km in 8×10^{-1} sec (answer in km/sec)

5. (a) Calculate the length of AD.
   (c) Calculate the area of quadrilateral ABCD.
   [The units of length are cm.].



6. In the isosceles right-angled triangle below, find the value of x, correct to 1 decimal place.



7. A circle has diameter 8 units.

   (a) Calculate its circumference, leaving your answer in terms of π.
   (b) Calculate its area, leaving your answer in terms of π.

8. (a) A circle is inscribed in a square of side 12 units.
   Calculate the area of the circle, leaving your answer in terms of π.
   (b) A circle is inscribed in a square of side $2a$ units.
   Calculate an expression for the area of the circle, leaving your answer in terms of a and π.

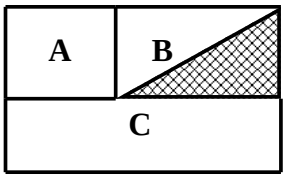
9. Evaluate, without a calculator:

   (a) $1\frac{1}{2}\times 2\frac{1}{3}$ (b) $3\frac{1}{4}\times 1\frac{1}{7}$ (c) $6\frac{1}{2}\div 3\frac{3}{4}$

   (d) $\frac{1}{2}$ of $\frac{1}{3}+\frac{1}{4}$ (e) $2\frac{1}{7}\div 1\frac{2}{3}$ (f) $2\frac{1}{2}\left(\frac{1}{4}+\frac{1}{2}\right)$

10. The sizes of the angles of a triangle are x°, $2x^\circ$ and $3x^\circ$.
    find the value of x and hence the size of eaqch angle.

11. The area of a circle is 100 square centimetres. Find its radius, to 3 significant figures.

12. 

    Rectangles A, B and C have areas in the ratio $2:3:4$.
    What fraction of the total area is shaded?

13. Find the distance travelled for each of the following journeys:

    (a) 3 hr 15 min at an average speed of 48 km/hr.
    (b) 47 min at an average speed of 90 km/hr.

14. A journey of 240 km is made in the following way:
    The first 30 km at an average speed of 60 km/hr.
    The last 50 km at an average speed of 50 km/hr.
    The middle part of the journey at an average speed of 80 km/hr.
    Find the time taken for the whole journey.