Pure 18 – Trigonometry

Please **complete** this homework by _____. Start it early. If you can't do a question you will then have time to ask your teacher for help or go to a drop in session.

Section 1 – Review of previous topics. Please complete all questions.

1. Find the following indefinite integrals.

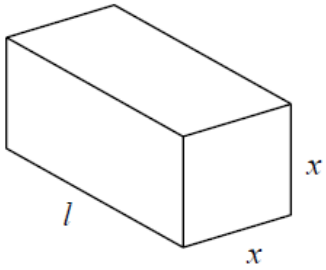
   a) $\int(6x^2+2)dx$ b) $\int x^{\frac{1}{3}}dx$ c) $\int(2+\sqrt{x})dx$ d) $\int 4x^{-3}dx$ e) $\int\frac{3}{x^2}dx$.

2. a) Express $x\sqrt{x}$ in the form x^k, where k is a constant.

   b) Hence find $\int x\sqrt{x}dx$

3. Evaluate a) $\int_1^8 x^{-\frac{1}{3}}dx$ b) $\int_1^4 6\sqrt{x}dx$

4. The diagram shows a square prism of length l cm and cross section $x$cm by $x$cm. Given that the surface area of the prism is 36cm^2,



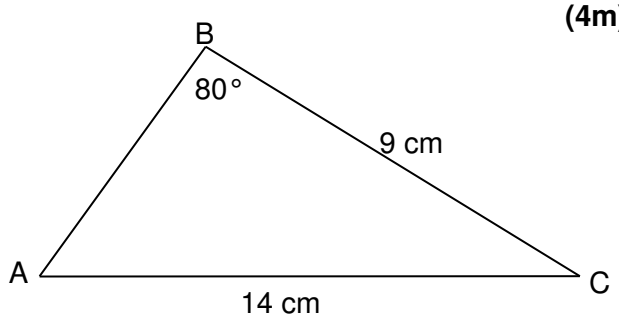
   a) Write down an equation for the surface area of the prism

   b) show that $l=\frac{18-x^2}{2x}$

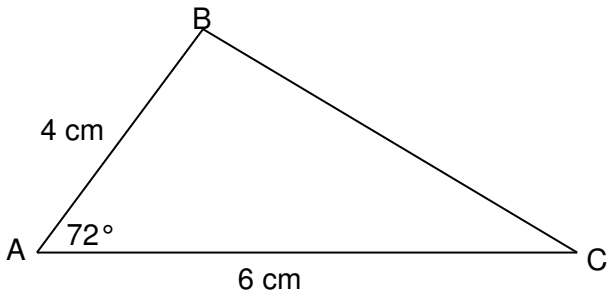
   c) Find the value of x for which the volume is a maximum and hence the value of l

Section 2 – Consolidation of this week's topic. Please complete all questions.

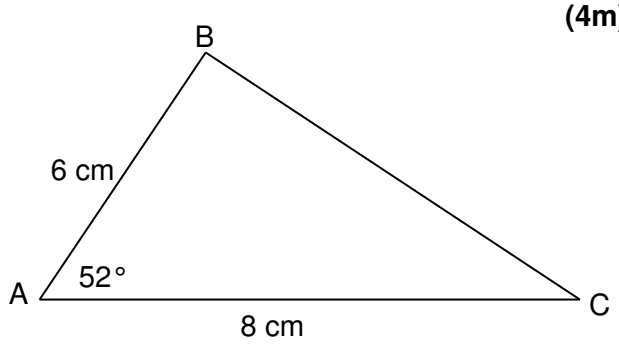
1. Use the sine rule to find the value of angle A. **(4m)**



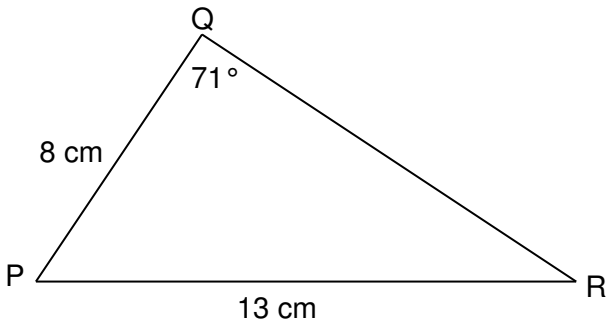
2. Calculate the area of the triangle. **(2m)**



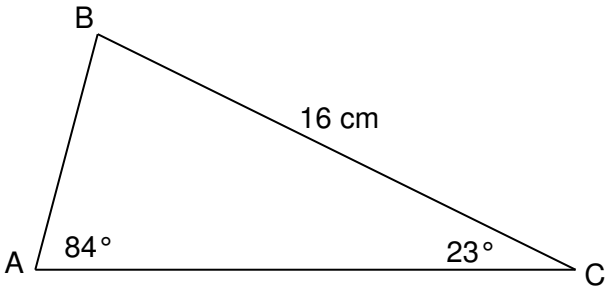
3. Use the cosine rule to find the length of BC. **(4m)**



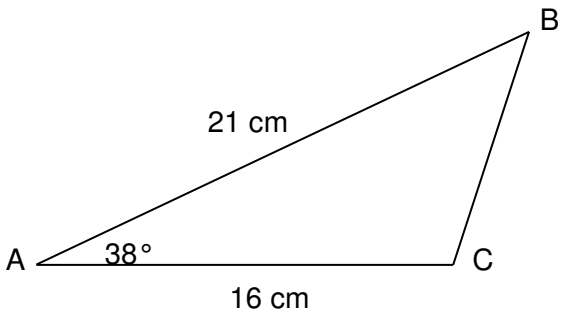
4. Find the size of angle R **(4m)**



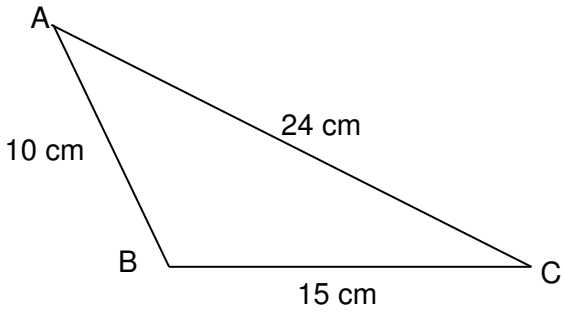
5. Calculate the length of AB**.** **(3m)**



6. Calculate the length of BC. **(4m)**



7. Calculate the size of angle B **(4m)**



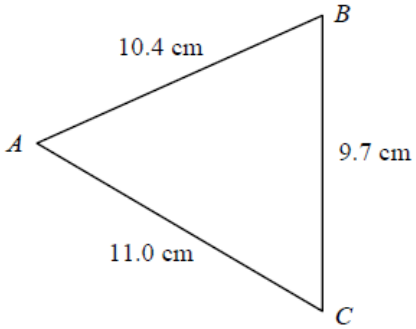
8. In the triangle ABC, angle A = 40°,

angle B = 75° and AB = 6 cm.

a) Calculate the length of AC **(3m)**

b) Find the area of the triangle. **(2m)**

9.



Find the area of the triangle ABC to 3 significant figures. **(6m)**

(Total 36 marks)

Section 3 – Extension questions. If you are aiming for a top grade, you should attempt these questions.

1. Joanne walks 4.2km on a bearing of 138°. She then walks 7.8km on a bearing of 251°.

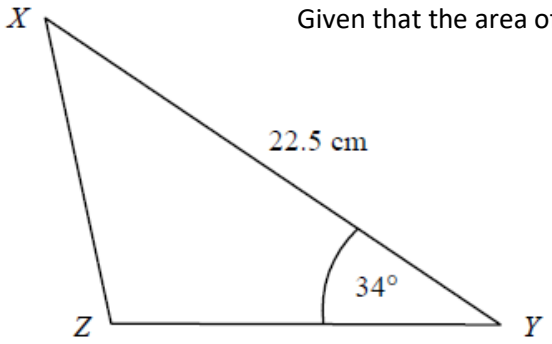
   a. Calculate how far Joanne is from where she started. **(4m)**

   b. Find as a bearing, the direction in which Joanne would have to walk in order to return to the point where she started. **(4m)**

2. A ferry and a cargo ship are both approaching the same port. The ferry is 3.2km from the port on a bearing of 076° and the cargo ship is 6.9km from the port on a bearing of 323°.

   Find the distance between the 2 vessels and the bearing of the cargo ship from the ferry.

   (8m)

3. 

   Given that the area of the triangle is 100cm^2, find the length XZ **(4m)**