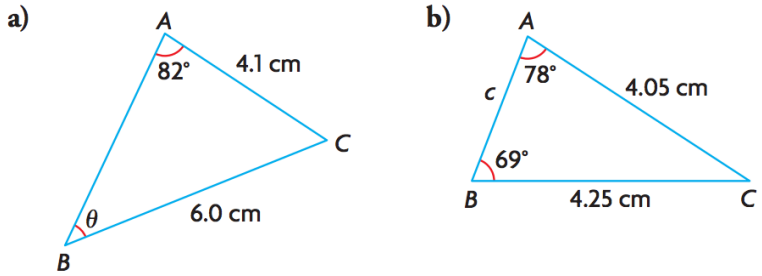
Chapter 7 & 8 Assignment: Trigonometry

Part 1: Knowledge (10 marks)

1. (5 marks) Determine the indicated side length or angle measure in each triangle.
   ***Use sine law for one question and cosine for the other.



2. (3 marks) Determine each unknown value. Round your answer to one decimal place.

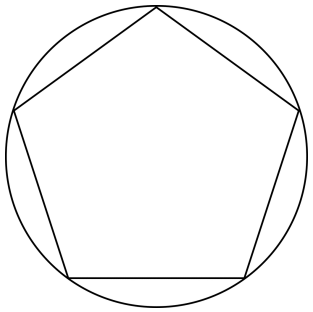
   $a)\ sin28° = \frac{x}{5}$ $b)\ cosB = \frac{7}{9}$

3. (2 marks) Define similar triangle.

Part 2: Thinking (10 marks)

4. (5 marks) Determine the acute angle to the nearest degree at which y = - 2x – 1 and y = x + 3 intersect. Include a diagram.

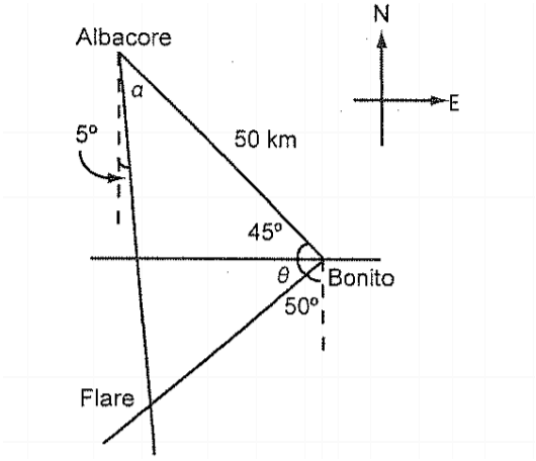
5. (5 marks) A regular pentagon is inscribed in a circle with radius of 12 as shown in the diagram. Determine the perimeter and area of the pentagon. Keep answer with 1 decimal places.



Part 3: Application (10 marks)

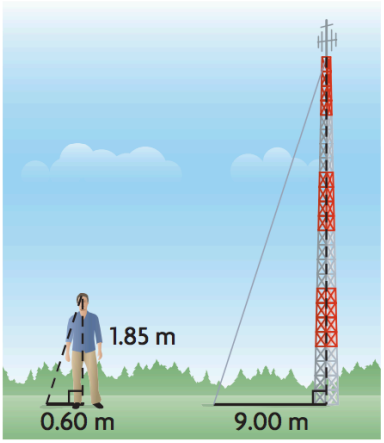
6. (5 marks) A pilot who is heading due north spots two forest fires. The fire that is due east is at an angle of depression of 47°. The fire that is due west is at an angle of depression of 38°. What is the distance between the two fires, to the nearest metre, if the altitude of the airplane is 2400? Include a diagram.

7. (5 marks) Two ships, the Albacore and the Bonito, are 50 km apart. The Albacore is N45° W (North 45° towards West) of the Bonito. The Albacore sights a distress flare at S5°E. The Bonito sights the distress flare at S50°W. How far is each ship from the distress flare?



Part 4:Communication (10 marks)

8. (4 marks) **Explain** how to prove the following two triangles are similar. And determine the height of the radio tower.



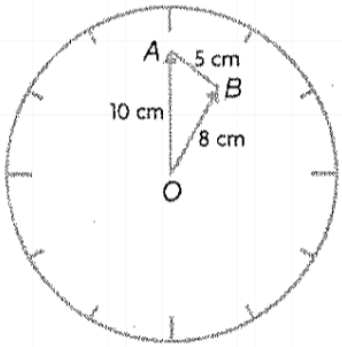
9. (6 marks) **Create** a real-life problem that can be modelled by an acute triangle. Then **describe** the problem, **sketch** the situation in your problem, and **explain** what must be done to solve it.

   Here is a sample answer:

Problem: The minute hand of a clock is pointing at the number 12 and is 10 cm long. The hour hand is 8 cm long. The distance between the tips of the hands is 5 cm. What time could it be?

Solution:

Draw a diagram to model the problem.



I can use the cosine law to solve for $\angle O$ because I know all three side lengths.

$$o^2 = b^2 + a^2 - 2\,ba\cos O$$
$$5^2 = 10^2 + 8^2 - 2(10)(8)\cos O$$
$$25 = 100 + 64 - 160\cos O$$
$$-139 = -160\cos O$$
$$\frac{-139}{-160} = \cos O$$
$$\angle O = \cos^{-1}\left(\frac{139}{160}\right)$$
$$\angle O \doteq 30°$$

A 30° angle is $\frac{1}{12}$ of the circular clock face

$360° \div 30° = 12$, which means the hands are one number apart.

There are two possible times depending on where the hour hand is positioned, behind or ahead of the minute hand, 1 o'clock or 11 o'clock.