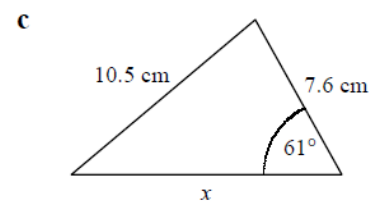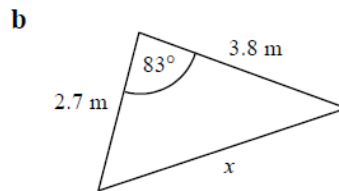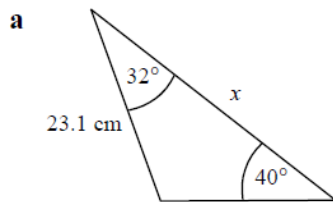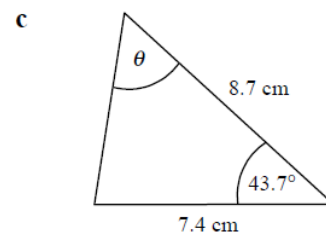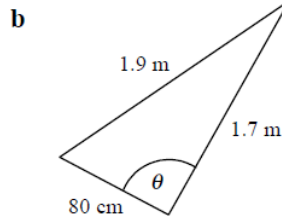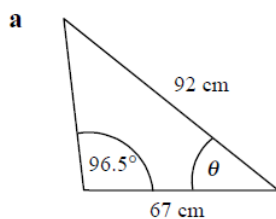# Pure 24 – Radians, Arcs and Sectors

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.

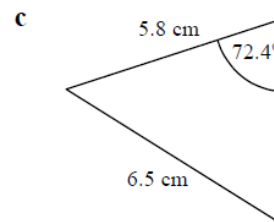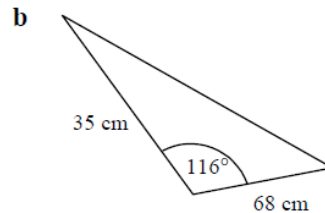## Section 1 – Review of previous topics. Please **complete** all questions.

1) In triangle ABC, AB = 16.2cm, BC = 12.3cm, and angle BAC = 37°. Find the two possible sizes of angle ACB in degrees to 1 decimal place.

2) Find the length x in each triangle.

a 32°, 23.1 cm, x, 40°

b 83°, 3.8 m, 2.7 m, x

c 10.5 cm, 7.6 cm, 61°, x

3) Find the angle θ in each triangle.

a 92 cm, 96.5°, θ, 67 cm

b 1.9 m, 1.7 m, θ, 80 cm

c θ, 8.7 cm, 43.7°, 7.4 cm

4) Find the area of each of the following triangles.

a 2.1 m, 66°, 3.4 m

b 35 cm, 116°, 68 cm

c 5.8 cm, 72.4°, 6.5 cm
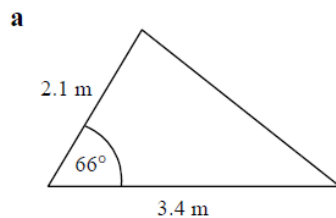
5) Sketch the graphs of

a) y = 3sinx for 0 ≤ x ≤ 360°   b) y = cos(x + 45) for 0 ≤ x ≤ 360°

c) y = tan2x for 0 ≤ x ≤ 360°   d) y = 2 + sin3x for 0 ≤ x ≤ 360°

Section 2 – Consolidation of this week's topic. Please <u>complete</u> all questions.

1) Convert each angle from degrees into radians, giving your answer in terms of π.
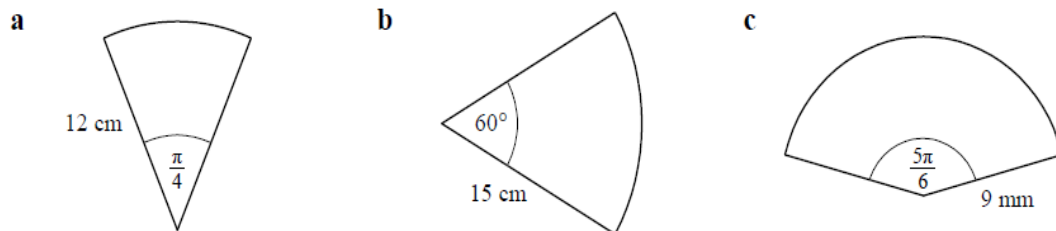   a) 180°　　b) 30°　　c) 45°　　d) 720°　　e) 18°

   (2 marks each)

2) Convert each angle from radians to degrees
   a) 2π　　b) $\frac{\pi}{3}$　　c) $\frac{3\pi}{4}$　　d) $\frac{\pi}{18}$　　e) $\frac{2\pi}{15}$　　f) $\frac{\pi}{30}$
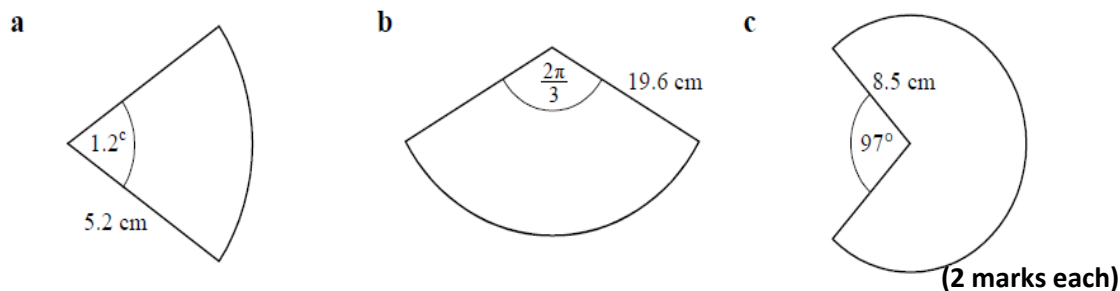
   (2 marks each)

3) Find, in terms of π, the length of the arc in each of the following circular sectors.

   a　12 cm, $\frac{\pi}{4}$
   b　60°, 15 cm
   c　$\frac{5\pi}{6}$, 9 mm

   (2 marks each)

4) Find, to 3 significant figures, the perimeter of each of the following circular sectors.

   a　1.2^c, 5.2 cm
   b　$\frac{2\pi}{3}$, 19.6 cm
   c　8.5 cm, 97°

   (2 marks each)

5) Find, in radians to 2 decimal places, the angle θ in each of the following circular sectors.

   a　θ, 16 mm, 11 mm
   b　θ, 7.2 cm, 35 cm
   c　17.9 cm, 20.3 cm, θ
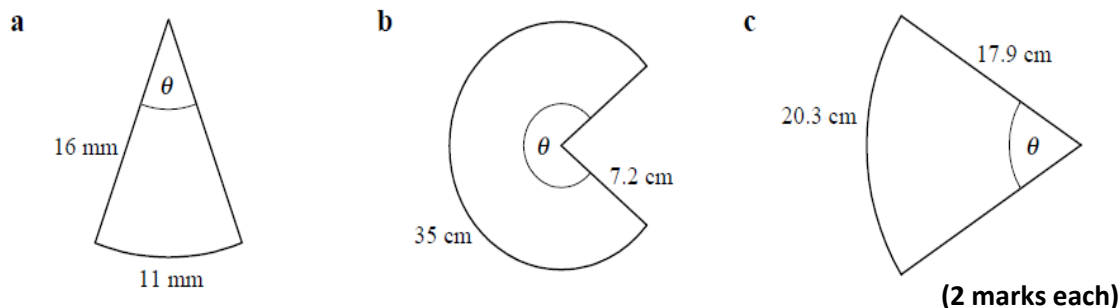
   (2 marks each)

6) Find, in cm² to 1 decimal place, the area of each of the following circular sectors.

   a　50 cm, $\frac{\pi}{3}$
   b　14.2 cm, 94°
   c　7 cm, 4.3^c
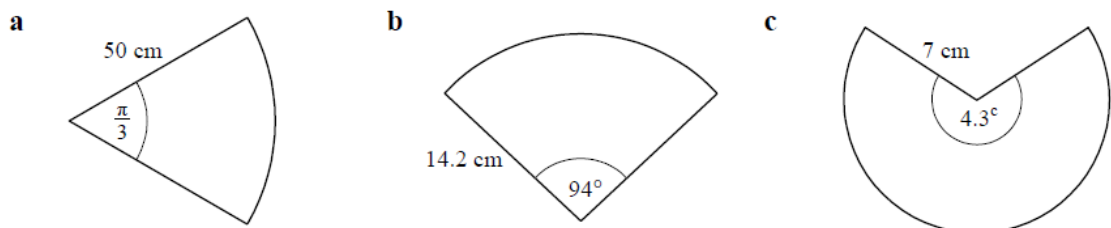
   (2 marks each)

7) In the triangle *ABC*, *AB* = 11 cm, *BC* = 7 cm and *CA* = 8 cm.

(*a*)   Find the size of angle *C*, giving your answer in radians to 3 significant figures.

(3)

(*b*)   Find the area of triangle *ABC*, giving your answer in cm^2 to 3 significant figures.
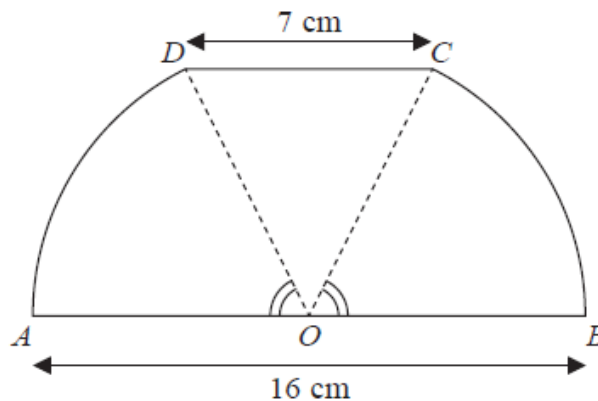
(3)

(Total 6 marks)

8)

Figure 1

Figure 1 shows a sketch of a design for a scraper blade. The blade *AOBCDA* consists of an isosceles triangle *COD* joined along its equal sides to sectors *OBC* and *ODA* of a circle with centre *O* and radius 8 cm. Angles *AOD* and *BOC* are equal. *AOB* is a straight line and is parallel to the line *DC*. *DC* has length 7 cm.

(*a*)   Show that the angle *COD* is 0.906 radians, correct to 3 significant figures.

(2)

(*b*)   Find the perimeter of *AOBCDA*, giving your answer to 3 significant figures.

(3)

(*c*)   Find the area of *AOBCDA*, giving your answer to 3 significant figures.

(3)

(Total 8 marks)
Total for Section 2 = 60 marks