Math 06, Homework 10 on radians and the circle
due Tue, Nov 19 at the start of class.

Write all your answers on a separate sheet. It is very important that you show clearly any work you had to do to get the answer. These first ten questions are 1 point each. Make sure your answers match the solutions on page 2.

(1) In a circle of radius 10 cm find the arc length determined by a central angle $\theta = 90°$, correct to two decimal places.

(2) In a circle of radius 10 ft find the central angle corresponding to an arc length $s = 30$ ft, correct to two decimal places.

(3) Find the circumference of a circle where a central angle of $7.2°$ determines an arc length of 439 miles.

(4) Express $60°$ as an exact number of radians.

(5) Express $-225°$ as an exact number of radians.

(6) Express $4\pi/3$ radians as an exact number of degrees.

(7) In a circle of radius 25 cm find the arc length determined by a central angle $\theta = 3$, correct to two decimal places.

(8) In a circle of radius 2 ft find the area of the sector determined by a central angle $\theta = 50°$, correct to two decimal places.

(9) In a circle of radius 400 ft find the area of the sector determined by a central angle $\theta = 1.6$, correct to two decimal places.

(10) Give the coordinates of the point $P(x, y)$ on the unit circle corresponding to $330°$.

These next five questions are 5 points each. Show clearly all your working out and reasoning.

(11) Find the circumference of a circle of radius 9 inches, correct to two decimal places.

(12) In a circle of radius 60 cm find the arc length determined by a central angle $\theta = 20°$, correct to two decimal places.

(13) In a circle of radius 60 cm find the arc length determined by a central angle $\theta = 2$, correct to two decimal places.

(14) In a circle of radius 60 cm find the area of the sector determined by a central angle $\theta = 2$, correct to two decimal places.

(15) Give the coordinates of the point $P(x, y)$ on the unit circle corresponding to an angle of $3\pi/2$.

Answers to questions (1)-(10):

(1) The arc length is 15.71 cm

(2) The central angle is $171.89°$

(3) The circumference is 21,950 miles

(4) $60° = \pi/3$ radians

(5) $-225° = -5\pi/4$ radians

(6) $5\pi/4$ radians equals $240°$

(7) The arc length is 75 cm

(8) The sector area is 1.75 ft^2 (area measured in square feet)

(9) The sector area is $128,000$ ft^2

(10) $P(\sqrt{3}/2, -1/2$