

Homework 14

(due April 24)

Math 130 *Kovitz* 2018

- The radius of the earth is about 3959 miles.
 - Boston, Mass. and Columbus, Ohio are about 800 miles apart. Find the angle (in radians and in degrees) made by two rays from the center of the earth through these two cities.
 - The distance from the UMass/Boston traffic circle to the Campus Center is about $\frac{1}{3}$ mile. Find the angle in seconds made by two rays from the center of the earth through these two landmarks.
(1 radian = $\frac{180}{\pi} = 57.29577951$ degrees, and 1 degree = 3600 seconds.)

- Two points on the surface of the Moon are 357.81 miles apart and the central angle to them equals 19° (nineteen degrees). Find the radius of the moon, rounded off to the nearest mile.

- Convert to radian measure: 6° (both in terms of π and as a decimal).
 - Convert to degree measure:
 - $\frac{\pi}{8}$
 - 9

Both of these numbers are in radian measure.

- Convert to radian measure in terms of π : 9 radians. (First estimate.)
- How long is an arc associated with an angle of 1° in a circle with radius 1145.9156 feet?
 - The radius of the earth is about 3959 miles. How far apart are two points on the surface of the earth that make a central angle of 1° (1 deg.)? $1'$ (1 min.)? [in feet] $0.01''$ ($\frac{1}{100}$ sec.)?
- A circular restaurant rotates at 2 revolutions per minute and has a diameter of 330 feet.

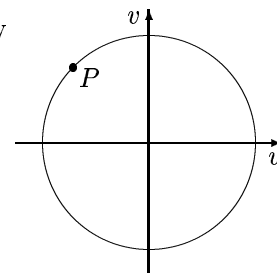
Find the angular speed of the restaurant in radians per second and the linear speed of a table at a window. The linear speed will be in feet per second. Using the fact that 22 feet per second is 15 miles per hour, convert the answer to miles per hour.

- In the unit circle, an arc 2.6 units long subtends a central angle of how many radians? Of how many degrees, to the nearest degree?
 - In a circle with 10-cm. radius, a 37 cm. arc subtends a central angle of how many radians? Of how many degrees, to the nearest degree?

- Find the six trigonometric ratios for angle θ . (The use of a calculator is permitted for the division only.)

- Solve this triangle. (Find all sides and angles.)
It is given that $\angle A = 25.5^\circ$ and $c = 135$.

- On the unit circle mark the points determined by
 - $\frac{3\pi}{8}$
 - $\frac{2\pi}{3}$
 - $-\frac{3\pi}{2}$
 - $-\frac{5\pi}{6}$



- Find a real number between 0 and 2π that determines point P .
 - Find a real number between -2π and 0 that determines point P .
- Is it a contradiction that P is determined by two different numbers?

