Trig 6.1

Change from radian to degree measure
Change from degree to radian measure
Find the length of an arc given the measure of the central angle
Find the area of a sector

proportion

unit circle

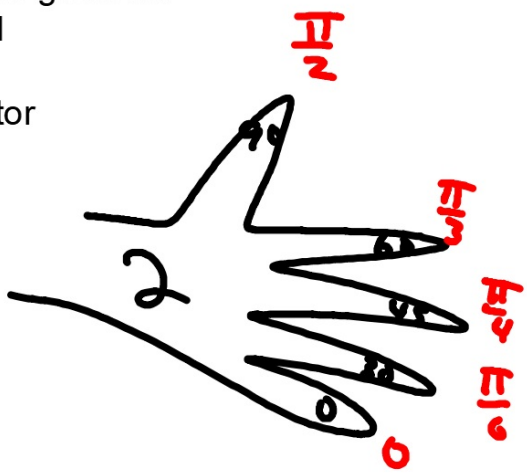
handy angles

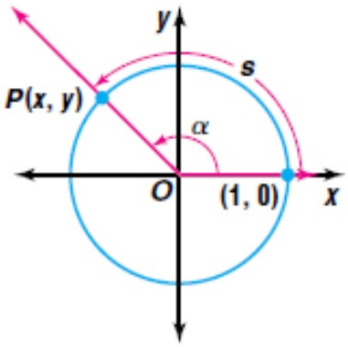
radian

circular arc

central angle

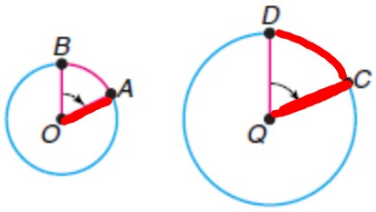
sector





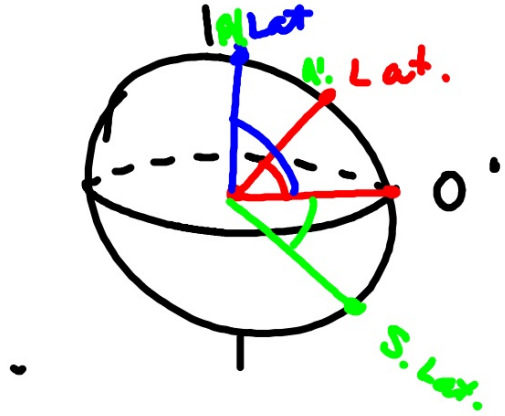
activity: triangle puzzle

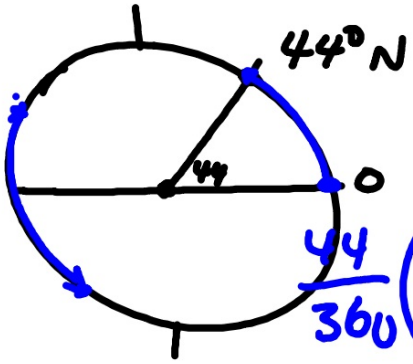
Radian measure can be used to find the length of a **circular arc.** A circular arc is a part of a circle. The arc is often defined by the **central angle** that intercepts it. A central angle of a circle is an angle whose vertex lies at the center of the circle.



The angle is the same. The length of arc depends on the size of the circle.

latitude and longitude (9th geography)





$\frac{44}{360}(\pi \cdot d)$

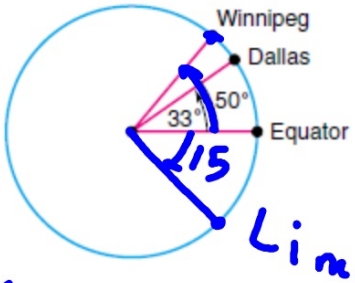
$r = 3960 mi$

$\frac{44}{360}(\pi \cdot 7920)$

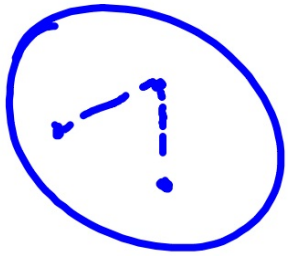
$d = 3041 mi$

Shortest distance from Winnipeg to Dallas???
Can't drill through the earth...

4 **GEOGRAPHY** **Winnipeg, Manitoba, Canada, and Dallas, Texas, lie along the 97° W longitude line. The latitude of Winnipeg is 50° N, and the latitude of Dallas is 33° N. The radius of Earth is about 3960 miles. Find the approximate distance between the two cities.**



Lines 15's



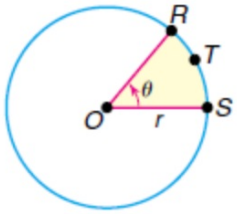
$\frac{17}{360}(\pi \cdot d)$

1175 mi

rθ

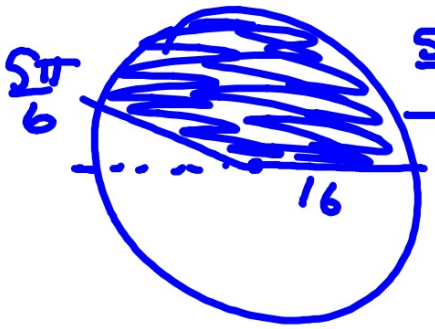
C of circle x fraction of circle

A **sector** of a circle is a region bounded by a central angle and the intercepted arc. For example, the shaded portion in the figure is a sector of circle O. The ratio of the area of a sector to the area of a circle is equal to the ratio of its arc length to the circumference.



(area)x(what fraction of the circle) $\frac{d}{360}$ $\frac{r}{2\pi}$

5 Find the area of a sector if the central angle measures $\frac{5\pi}{6}$ radians and the radius of the circle is 16 centimeters. Round to the nearest tenth.



$\frac{5\pi}{6}$

$\frac{5\pi}{12\pi}(\pi \cdot 16^2)$

$\frac{5}{12}(804.25)$

$535.1\ cm^2$

Find the area of each sector given its central angle θ and the radius of the circle. Round to the nearest tenth.

13. $\theta = \frac{2\pi}{3}, r = 1.4$

14. $\theta = 54°, r = 6$