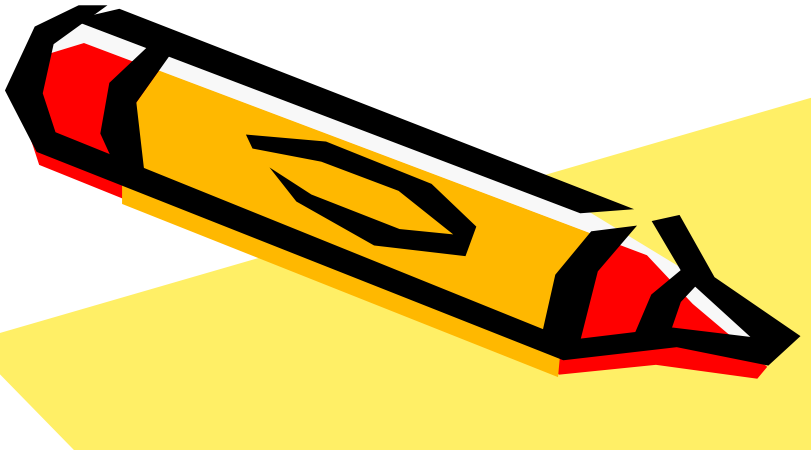
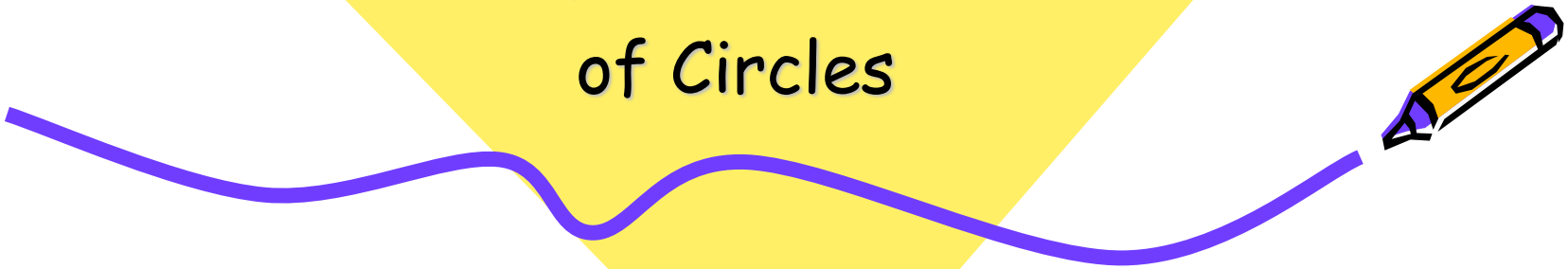


Geometry

Circumference and Area of Circles



Formulas

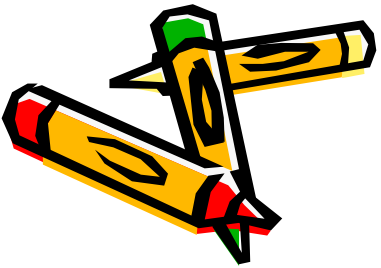
Diameter = 2 * radius

Circumference = $2\pi r$ or πd

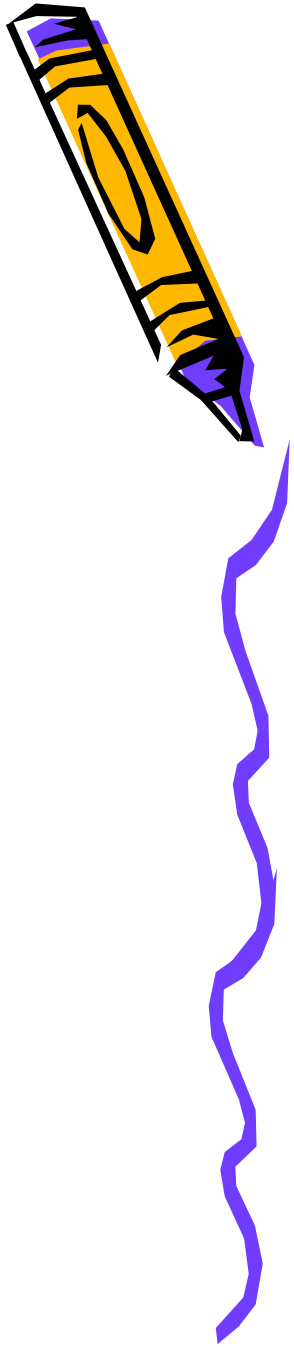
Area = πr^2

Use 3.14 for π

The word "exact" means that no rounding is allowed. Therefore, answers will be in terms of π . In other words, leave the symbol π in your answer. DO NOT use 3.14.



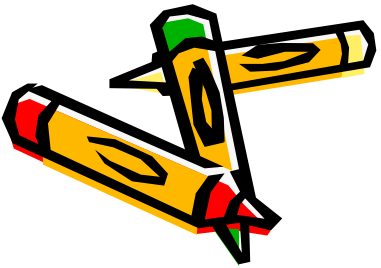
Example



Given circle R with a radius of 6:

Circumference = 37.68
Exact circumference = 12π

Area = 113.04 units^2
Exact Area = 36π units^2



Practice

Complete the following:

r = 9
d =
circ =
area =

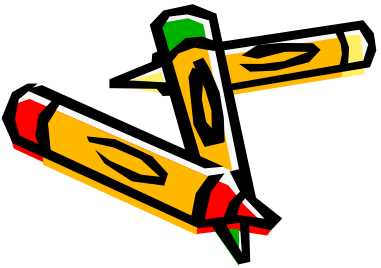
r =
d = 36
circ =
area =

r =
d =
circ = 75.36
area =

r = 5
d =
exact circ =
exact area =

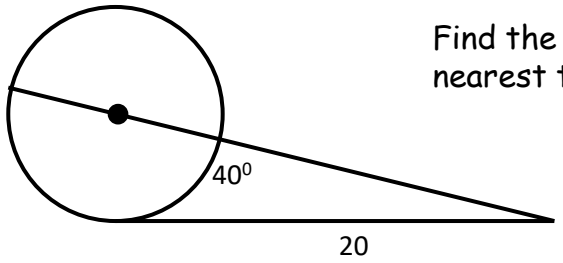
r =
d = 20
exact circ =
exact area =

r =
d =
exact circ = 40π
exact area =

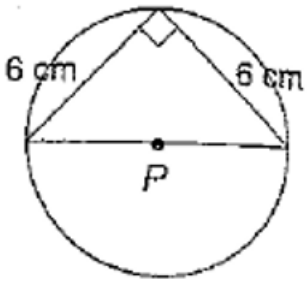


Practice

Relying on old skills



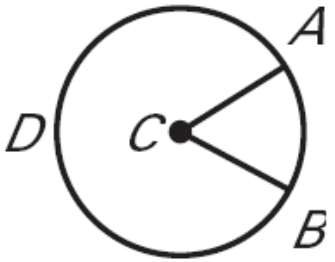
Find the circumference. Round to the nearest tenth if needed.



Find the exact circumference.

Arc Length

An arc's length is a portion of the circle's circumference. This is different from the arc's measurement, but closely related.



Determine the arc's length by multiplying the circle's circumference by the measurement of the arc's central angle.

If $m\angle ACB = 50$ and $AC = 5$, then: circumference = 31.4

The arc represents 50^0 of the circle, so we can determine the length of the arc using the proportion:

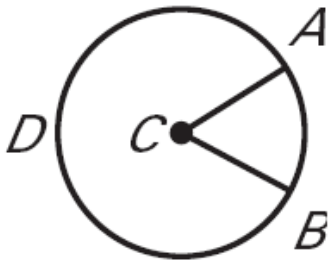
$$\frac{50}{360} = \frac{x}{31.4}$$

length of $\overset{\frown}{AB}$ = 4.36

Area of a Sector

A sector is a portion of the circle's area.

Determine the area of a sector by multiplying the circle's area by the measurement of the sector's central angle (or arc measurement).



If $m\angle ACB = 50$ and $AC = 5$ ft, then: area = 78.5 ft^2

The arc represents 50^0 of the circle, so we can determine the area of the sector using the proportion:

$$\frac{50}{360} = \frac{x}{78.5}$$

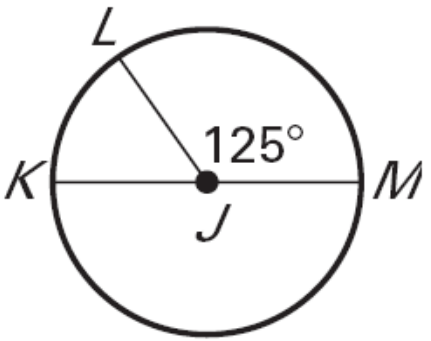
area of the sector = 10.9 ft^2

Practice

Given KM = 18

Find the length **of each arc of $\odot J$, where $\overline{KM}$ is a diameter.**

a. $\overset{\frown}{LM}$ **b.** $\overset{\frown}{LMK}$ **c.** $\overset{\frown}{KLM}$



Find the area of sector KJL