Ch 11

Circumference and Area of Circles

Definition:

A **CIRCLE** is the set of all points in a plane that are the same distance from a given point, called the center of the circle.

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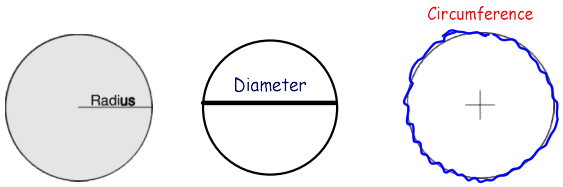
The distance from the center to a point on the circle is the ***RADIUS***. r

The distance across the circle, through the center, is the ***DIAMETER***. d

$r = \frac{1}{2}d$

The ***CIRCUMFERENCE*** of a circle is the distance around the circle.



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- For any circle, the ratio of the circumference to its diameter is denoted by the Greek letter ***π***, or ***pi***.
- 3.14 is used for π.

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Circle Formulas

- Circumference = π (diameter)
  = 2π (radius)
- Area = π (radius)^2

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Find the Circumference & Area of these circles

① 5in

Area = $\pi \cdot r^2 = \pi \cdot 5^2 = 78.5 in^2$

Circumference = $2\pi r = 2\pi \cdot 5 = 10\pi = 31.4 in$

② 2mm

Area = $2^2\pi = 4\pi = 12.56 mm^2$

Circumference = $2\pi r = 4\pi = 12.56 mm$

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③ Find the radius of a circle with area = 366 in^2

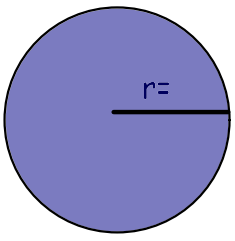
$A = \pi r^2$

$\frac{366}{\pi} = \frac{\pi r^2}{\pi}$

$116.50 = r^2$

$\sqrt{116.50} = \sqrt{r^2}$

$r = 10.79 in$



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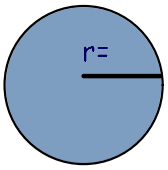
Find the radius of a circle with Circumference = 533 mm



$C = 2\pi r$

$\frac{533}{2} = \frac{2\pi r}{2}$

$\frac{266.5}{3.14} = \frac{\pi r}{3.14}$

$r = 84.87\ mm$

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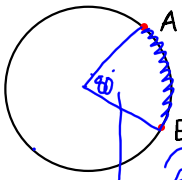
Arc Length = A portion of the circumference of a circle.

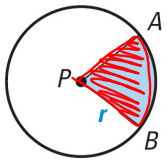


$\overset{\frown}{AB}$

$$arclength\,\overset{\frown}{AB} = \frac{m\overset{\frown}{AB}}{360^\circ} \cdot 2\pi r$$

Apr 23-12:58 PM

SECTOR OF A CIRCLE: the region bounded by two radii of the circle and their intercepted arc.



$$A = \frac{m\overset{\frown}{AB}}{360^\circ} \cdot \pi r^2$$

Feb 28-3:05 PM

Find the area of the shaded region.

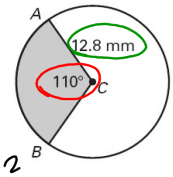
$A = \frac{m\overset{\frown}{AB}}{360} \cdot \pi r^2$

$A = \frac{110}{360} \cdot \pi \cdot 12.8^2$

$A \approx (.30 \cdot 3.14 \cdot 163.84)$

$110 \div 360 = 0.30 \times \pi = 0.95$

$\times 12.8^2$



$= 157.19\ mm^2$

Mar 4-8:23 AM

TOYO:

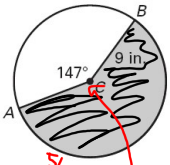
Find the area of the shaded region.

$A = \frac{m\overset{\frown}{AB}}{360} \pi \cdot r^2$

$A = \frac{213}{360} \cdot \pi \cdot 9^2$

$A = 59 \cdot 3.14 \cdot 81$

$= 150.56 in^2$



$360 - 147 = 213°$

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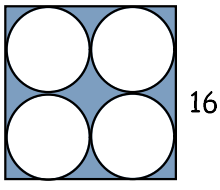
TOYO:

Find the area of the shaded region



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