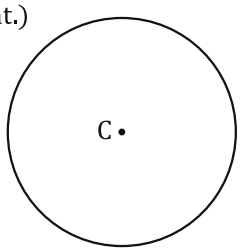
Circles

Round and round we go, and where we'll stop? Well, we won't stop I guess...

A Circle: We all know what they look like, but what is it? Well, the overly technical definition of a circle is the set of points equidistant from a single point. Huh? In other words, that nice round shape you see is a bunch of points that are all exactly the same distance away from the center. This is circle C. (You name circles by their center point.)

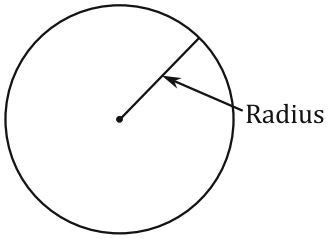


Circle C, ⊙C

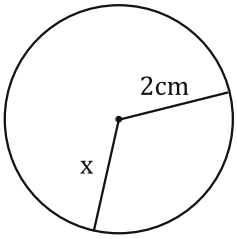
This symbol means "circle."

Pretty cool huh? Let's look at some more properties of circles....

Radius: The radius is the distance that is from the center of the circle to the edge. It is the same length everywhere in the circle, because it is that distance from the center that makes the circle from its definition above. (The radius is also half the length of the diameter.) All radii (plural form...more than one...not radiuses) from the same circle are equal.



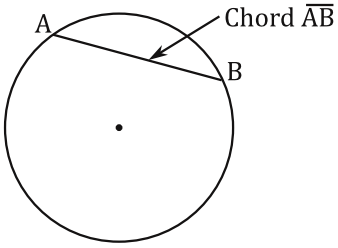
Ex. 1. Find the value of x.

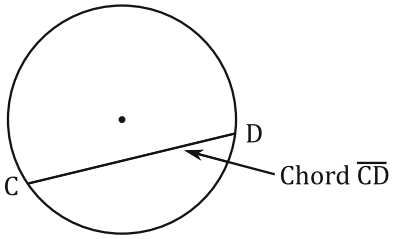


Answer:

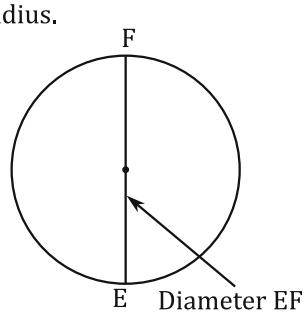
x=2cm because all radii in a circle are equal.

Chord: A chord is a line drawn inside the circle that touches the circle at its endpoints.

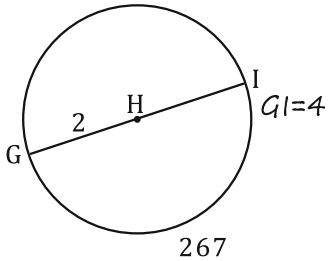




A Diameter is a special chord that goes through the center of the circle. It is also twice as long as the radius.

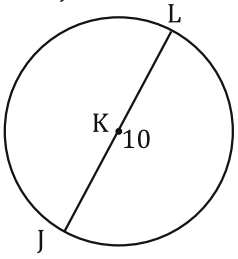


Ex. 2. Find the length of diameter GI if GH=2.



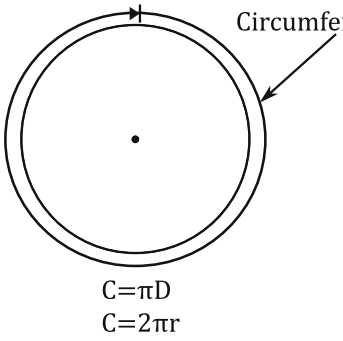
GI=4

Ex. 3. Find the length of radius JK if KL=10.

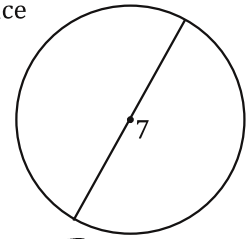


JK=5

Circumference: Ah pie, delicious apple or cherry, hot out of the oven. No wait, not that kind of pie! This one has no "e". The circumference is the distance around the circle. Its distance is πD and because D=2r then 2πr is also very popular for the distance of the circumference. Its measurement is 360°.

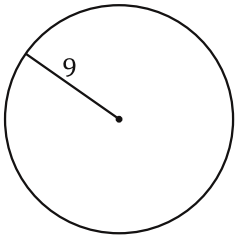


Ex. 4. Find the circumference of cirlce Q if the diameter is 7.



C=TTD
C=7TT≈21.99

Ex. 5. Find the circumference of cirlce Q if the radius is 9.

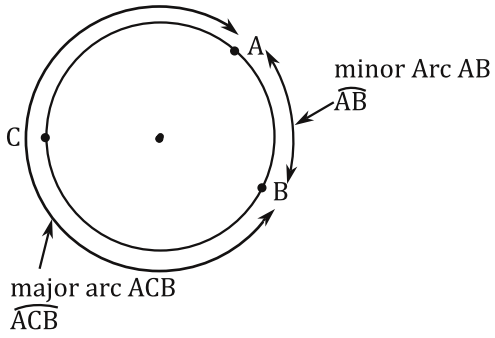


C=2TTr
C=2TT9
C=18TT≈56.55

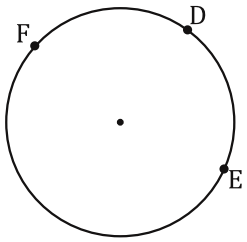
These steps seem to be out of order. Don't worry, multiplication is commutitive. This is how it's usually done.

A note about π "pi." π is actually the ratio of the circumference to the diameter C/D and is approximately equal to 3.14159265358979238462643383279502884197169399 37...and never ever ends. Very interesting... Some people have memorized this out thousands of digits, (Get a job, right?) and I think there is a super computer still working on it to see if it will ever end. Some texts and places don't even want you to multiply by pi, hence "7π" as in the answer to example 4. This is called "in terms of pi". Some people want you to write it out. For the exercises that follow you should do both so you are used to both. For pi, just round to 3.14159. That's usually plenty accurate unless you're measuring amoeba's or splitting atoms.

An Arc is simply part of the circumference. A Minor Arc is the short one. The Major Arc is the long one. Always use 3 points when naming a major arc to seperate it from the minor arc.

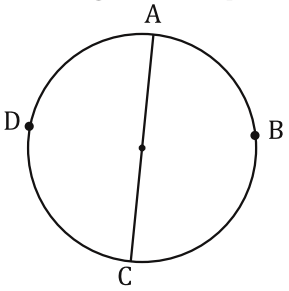


Ex. 6. Find $m\overset{\frown}{DEF}$ if $m\overset{\frown}{DE}=127°$.



$m\overset{\frown}{DEF}+m\overset{\frown}{DE}=360°$
$m\overset{\frown}{DEF}+127°=360°$
$-127°\ -127°$
$m\overset{\frown}{DEF}=233°$

A Semi-Circle is an arc that intercepts a diameter. The diameter actually cuts the circle in half so the semi-circle is always 360°/2 or 180°. By the way, "intercept" is a funny word. All it means is that the ends of the arc are the same as the ends of the diameter or whatever is intercepting the arc. (We'll have angles intercept arcs in the next section. Won't that be fun!)



Arc $\overset{\frown}{ABC}$ and $\overset{\frown}{CDA}$ both measure 180°.

Okay, get your wheels and lets practice!