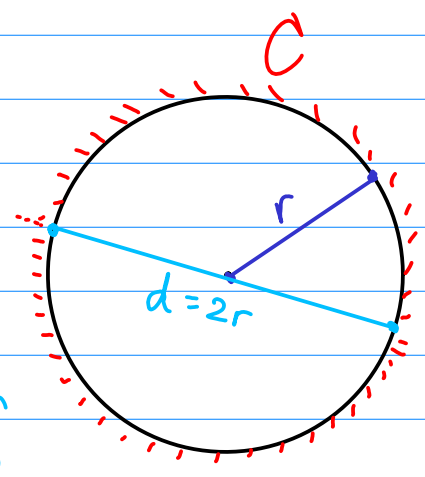


§6.5: Circumference

* Circumference: "perimeter" of a \odot ;
distance around a \odot .



* $C = \pi(d)$ $d = 2r$

$a = \pi \times d \text{ in}$
 $= 6.28 \text{ in}$

$C = \pi \cdot 2r$

* $C = 2\pi r$

• What is π ? Greek letter "pi"; represents a #

In this course: $\pi \approx 3.14$

Need more accuracy: $\pi \approx 3.141592653\dots$
 ↗ goes on forever without repeating!

Ex: $2.646464\dots$
 $2.\overline{64}$

↓ convert to a fraction

$$\begin{array}{r} 100 \cdot x = 264.646464\dots \\ - \quad x = 2.646464\dots \\ \hline 99x = 262.0 \\ \hline x = \frac{262}{99} \end{array}$$

$$\begin{array}{r} 2.646464\dots \\ \times 100 \\ \hline 264.6464\dots \\ - \quad 2.646464\dots \\ \hline 264.6464\dots \end{array}$$

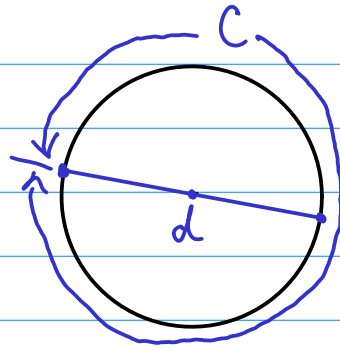
$x = \frac{262}{99}$ ← ratio of 2 whole #'s → RATIONAL #

Since π has no repeating pattern, we cannot express it as a ratio of 2 whole #'s

$\therefore \pi$ is not rational IRRATIONAL

• What does π represent/mean?

π is the ratio of a \odot 's circumference to its diameter. That ratio is always ≈ 3.14 .



$$\frac{C}{d} = \frac{\pi \cdot d}{d}$$

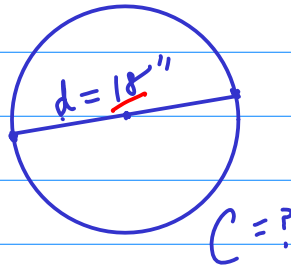
$$\frac{C}{d} = \pi$$

Ex:

① $w/d = 18''$; Find the EXACT value of the circumference.

Steps:

- ① draw diagram
- ② label
- ③ Use formula & solve.



$$C = \pi d \text{ or } C = 2\pi r$$

$$C = \pi \cdot 18''$$

$$\boxed{C = 18\pi''} \leftarrow \text{EXACT value, written in terms of } \pi$$

5.684
 ≈ 5.7

approximate to the nearest tenth

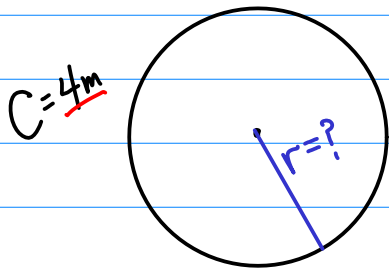
$$C \approx 18(3.14)''$$

$$C \approx 56.52''$$

$$\boxed{C \approx 56.5''}$$

$$\begin{array}{r} 3.14 \\ \times 18 \\ \hline 2512 \\ + 3140 \\ \hline 56.52 \end{array}$$

Ex: $C = 4\text{m}$; Find the exact value of r .



$$C = 2\pi r \text{ or } C = \pi d$$

$$2 \cdot 4 = 2\pi r$$

$$\frac{2}{\pi} \text{m} = r$$

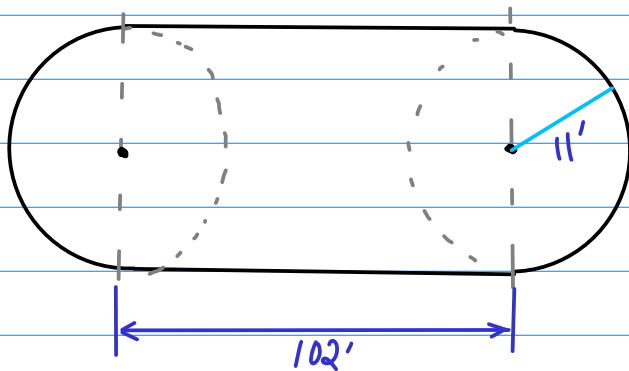
round to nearest hundredth

$$\frac{2}{3.14} \text{m} \approx r$$

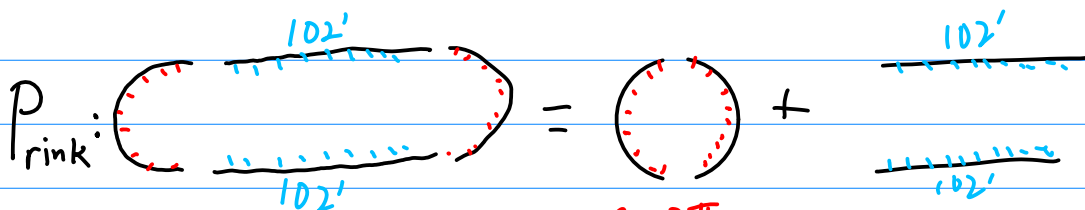
$$.6369 \text{m} \approx r$$

$$.64 \text{m} \approx r$$

Ex: Balboa Ice Rink (irregularly shaped)



Find the perimeter of the rink.



$$C = 2\pi r$$

$$= 2\pi(11)$$

$$= 22\pi'$$

$$+ 204' = (22\pi + 204)'$$