arc
(part of a circle)

diameter · (endpoints on circle, passes through center)

radius
(center → any pt on the circle)

center

central angle

sector

chord
(endpoints are any 2 points on a circle)
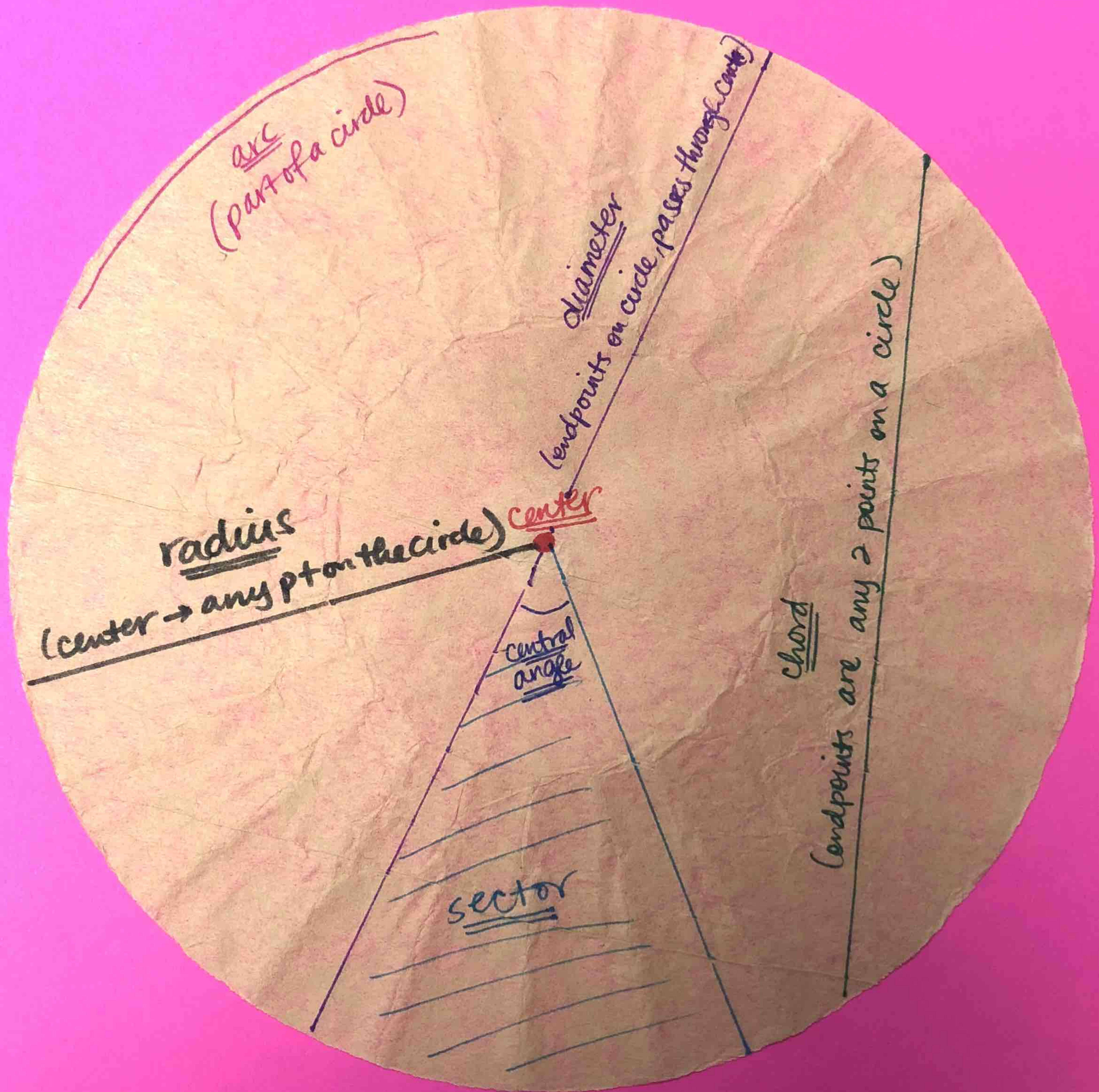
8.1 Circles and Circumference

__circle__ – the set of all points that are the same distance from a point called the center

__radius__ – the distance from the center to any point on the circle

__diameter__ – the distance across the circle through the center
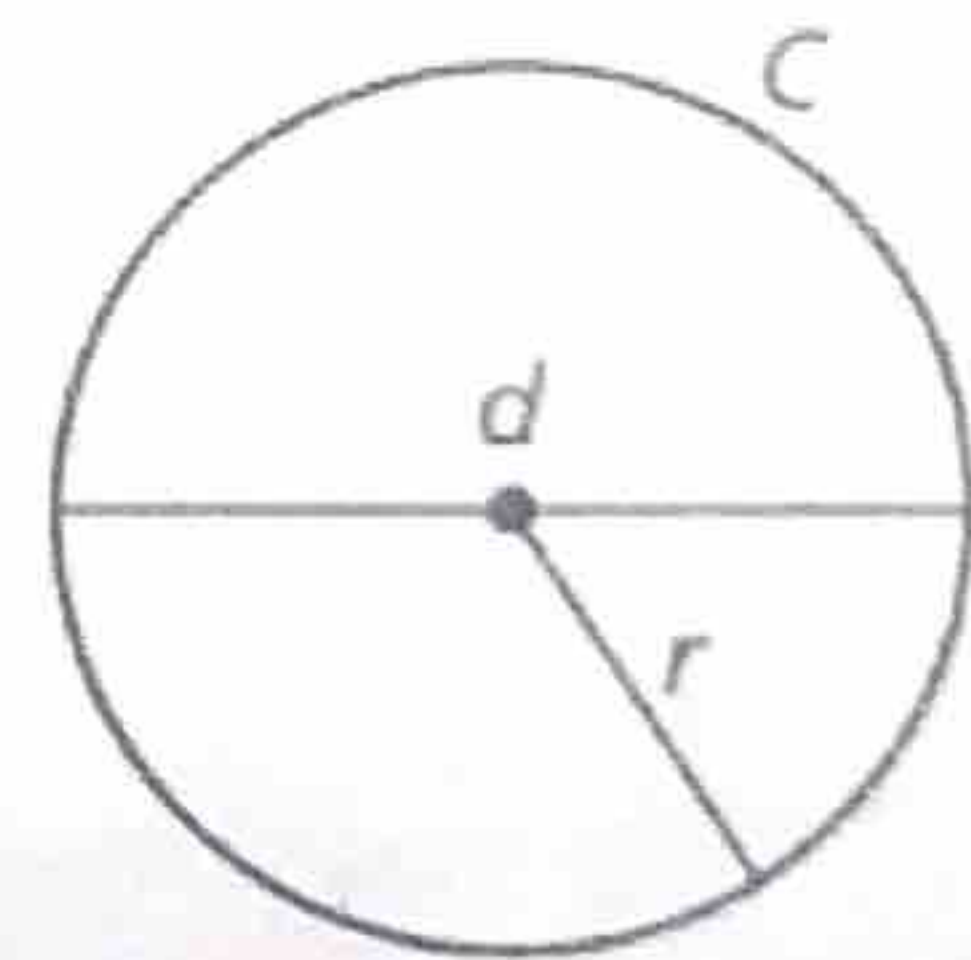   (twice as long as the radius)

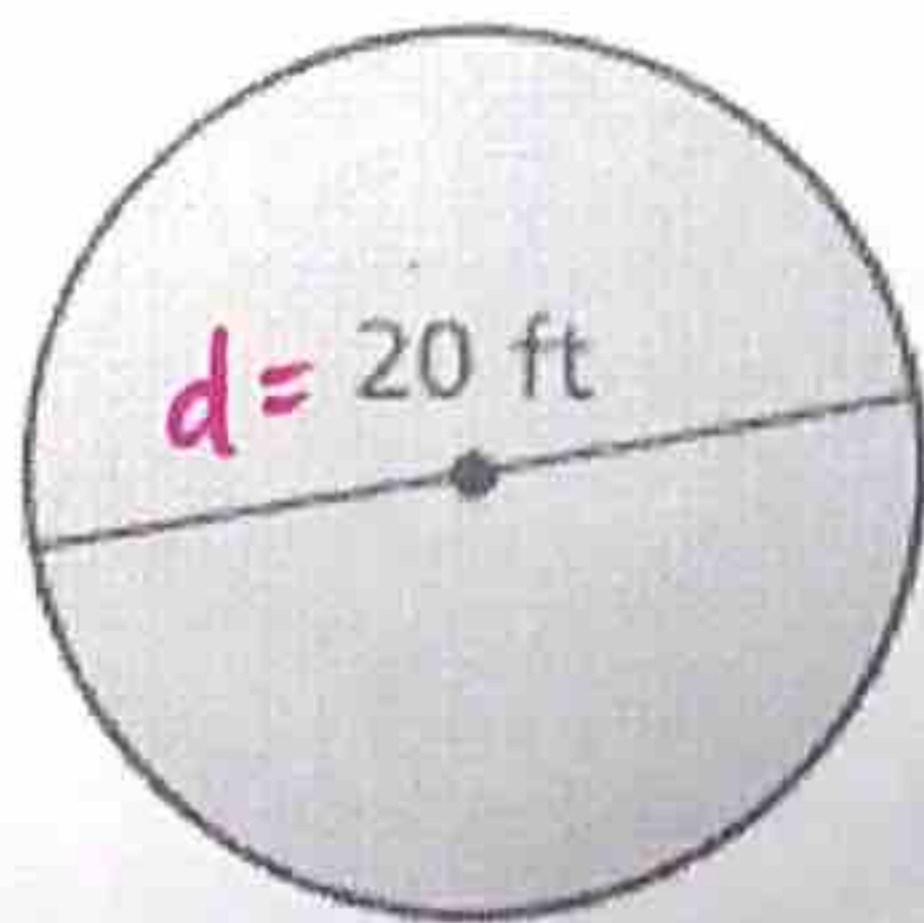__circumference__ – the distance around a circle (like perimeter)

Key Idea

Circumference of a Circle

Words The circumference C of a circle is equal to π times the diameter d or π times twice the radius r.

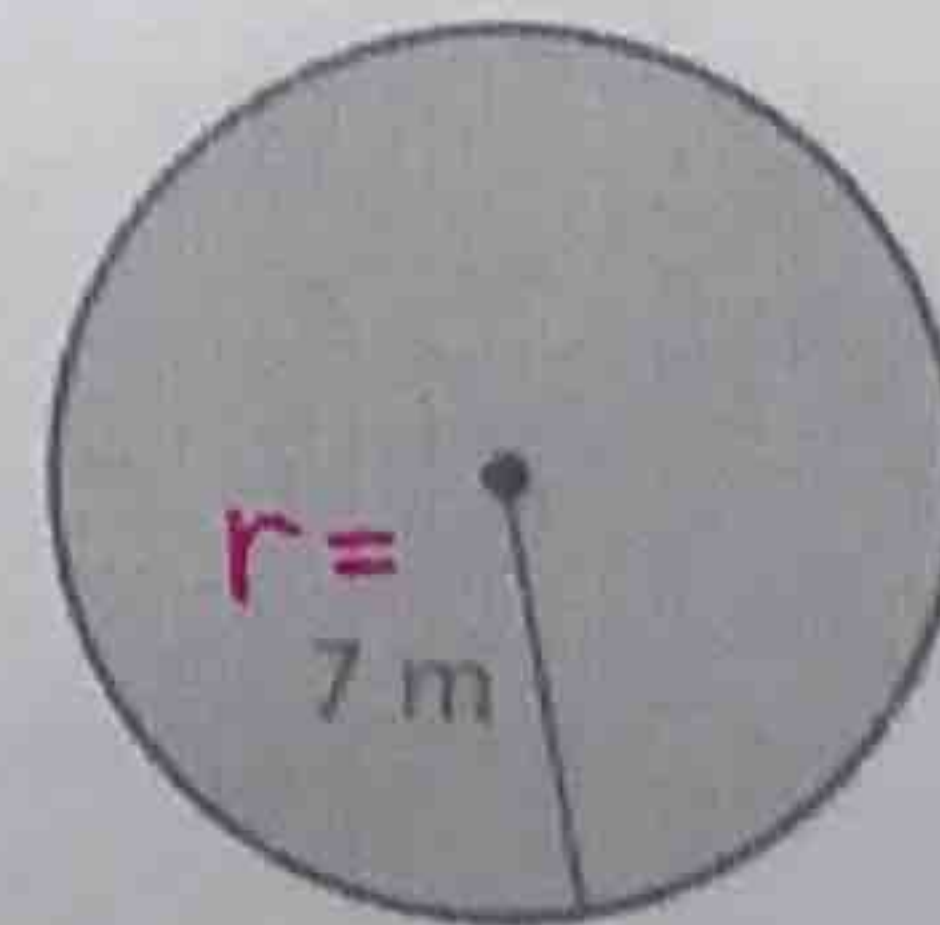**Algebra** $C = \pi d$ or $C = 2\pi r$

Ex: Find the radius.

$d = 20$ ft

$d = 20 ft$

$r = \frac{1}{2}(20)$

$\boxed{r = 10 ft}$

Ex: Find the diameter

$r =$
7 m

$r = 7m$

$d = 2(7)$

$\boxed{d = 14 m}$

Find each circumference.

Ex:

$r = 5$ in

$C = 2\pi r$

5 in.

$C = 2\pi r$

(calc) $C = 2\pi(5) \approx \boxed{31.42 \text{ in}}$

(no calc) $C \approx 2(3.14)(5) \approx \boxed{31.4 \text{ in}}$
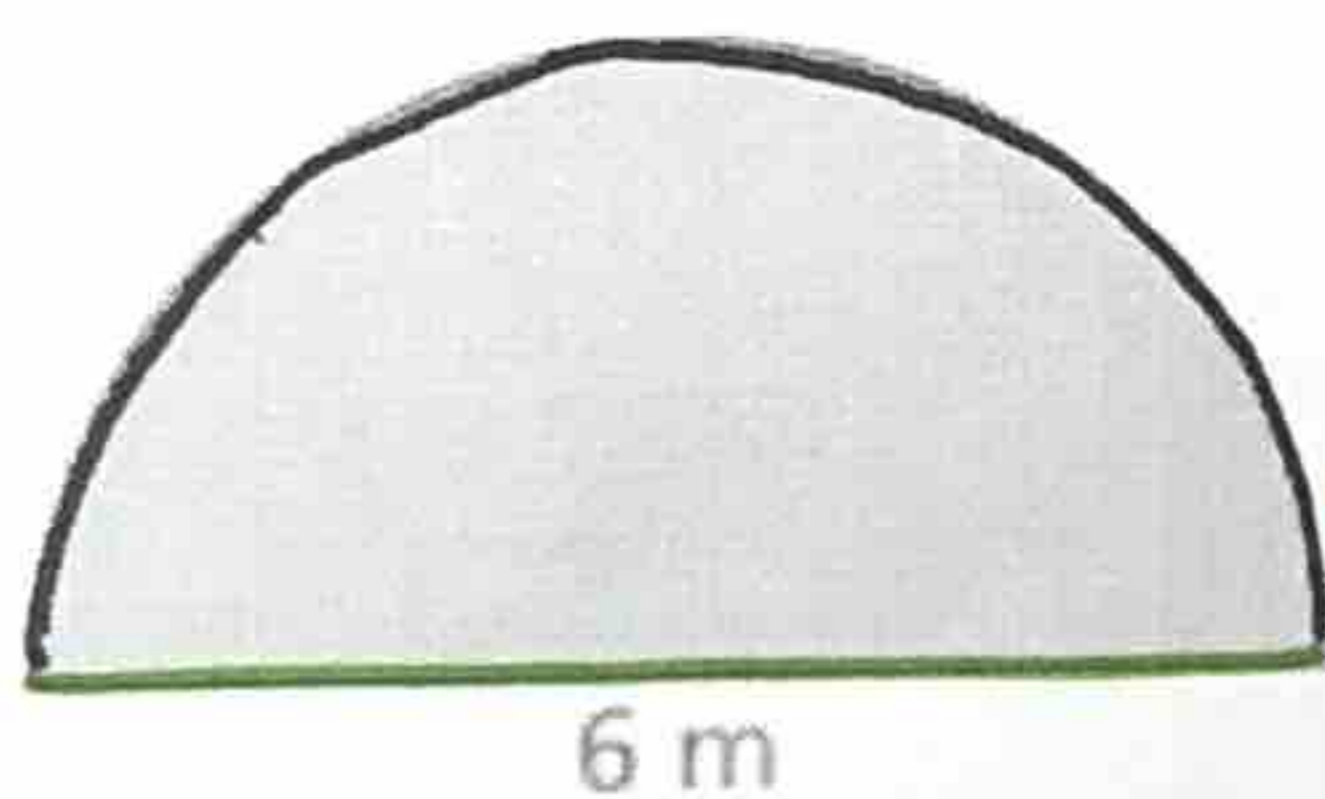
Ex:

$d = 28$ mm

$C = \pi d$

28 mm

$C = \pi d$

(calc) $C = \pi(28) \approx \boxed{87.96 \text{ mm}}$

(no calc) $C \approx (3.14)(28) \approx \boxed{87.92 \text{ mm}}$

Ex:

$d = 6$ m

$C = \pi d$

6 m

$C = \pi d$ (for FULL CIRCLE)

(calc) $C = \pi(6) \approx 18.85$ m

(no calc) $C \approx (3.14)(6) \approx 18.84$ m
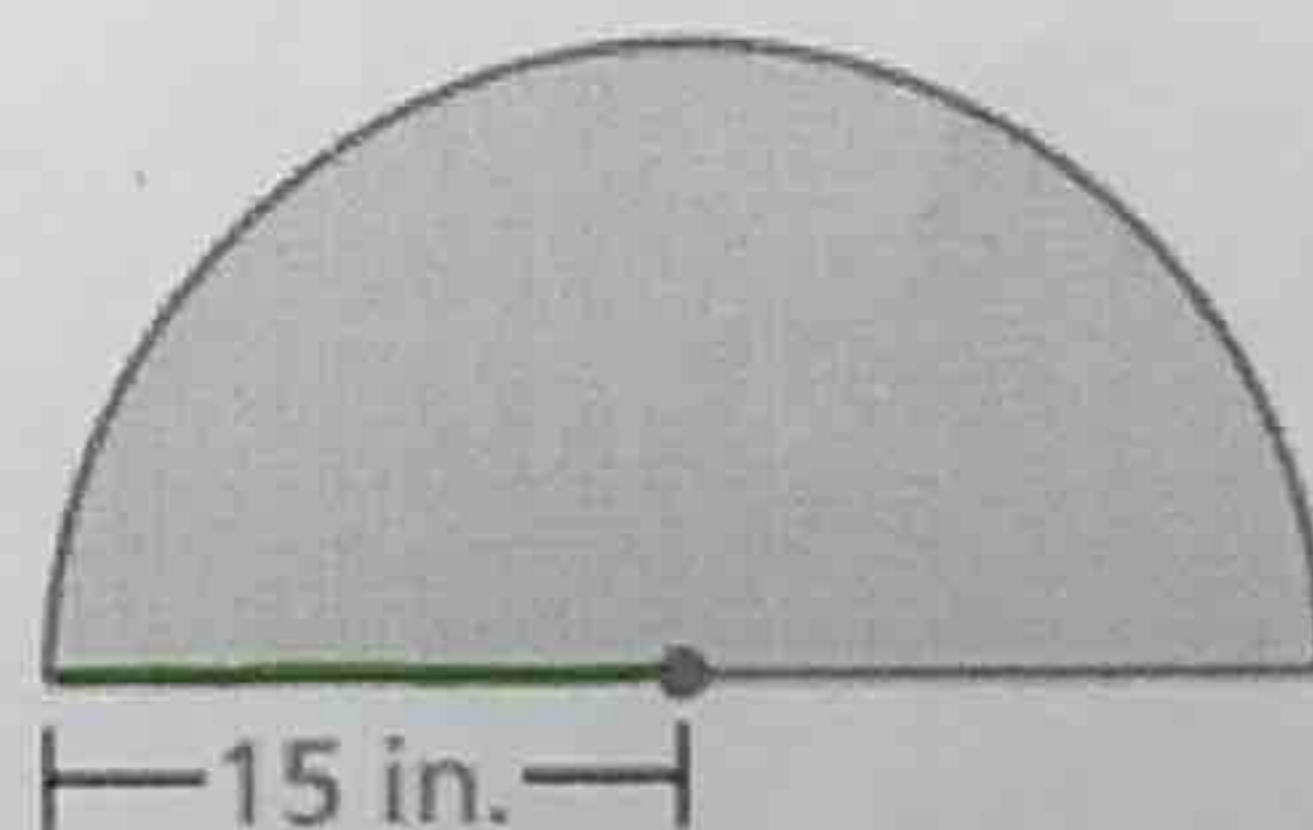
for HALF CIRCLE $\frac{1}{2}C = \frac{1}{2}(18.85) \approx 9.42$ m

$\frac{1}{2}C = \frac{1}{2}(18.84) \approx 9.42$ m

add on 6m straight side:

$P \approx 9.42 + 6.00$

$\boxed{P \approx 15.42 \text{ m}}$

Ex:

$r = 15$ in

$C = 2\pi r$

15 in.

$C = 2\pi r$ (for FULL CIRCLE)

(calc) $C = 2\pi(15) \approx 94.25$ in

(no calc) $C \approx 2(3.14)(15) \approx 94.2$ in

for HALF CIRCLE $\frac{1}{2}C = \frac{1}{2}(94.25) \approx 47.12$ in

$\frac{1}{2}C = \frac{1}{2}(94.2) \approx 47.1$ in

add on 15in +15in straight:

$P \approx 47.12 + 15 + 15 \approx \boxed{77.12 \text{ in}}$

$P \approx 47.1 + 15 + 15 \approx \boxed{77.1 \text{ in}}$