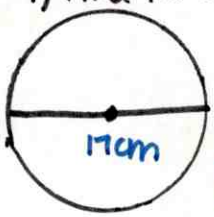
11.4

Find the indicated measures.

3) Find the circumference.

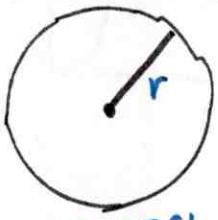
$C = 2\pi r$
$r = 6$
$C = 2\pi(6)$
$C = 12\pi$ in 37.7

4) Find the circumference.



$C = 2\pi r$
$d = 17$
$C = \pi d$
$C = 17\pi$ cm
53.4

5) Find the radius.



$C = 2\pi r$
$C = 63$
$\frac{63}{(2\pi)} = \frac{2\pi r}{(2\pi)}$
$C = 63$ ft.
$r = \frac{63}{2\pi}$ ft 10

6) The exact circumference of a circle with diameter 5 inches.

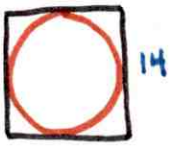
$C = \pi d$
$d = 5$
$C = 5\pi$ in

7) The exact radius of a circle with circumference 28π meters.

$C = 2\pi r$
$C = 28\pi$
$\frac{28\pi}{(2\pi)} = \frac{2\pi r}{(2\pi)}$
$r = 14$ m

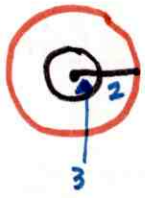
Find the circumference of the red circle.

8)



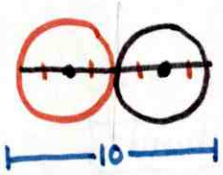
$C = 2\pi r$ or πd
$d = 14$
$C = 14\pi$ 44

9)



$C = 2\pi r$
$r = 5$
$C = 2\pi(5)$
$C = 10\pi$ 31.4

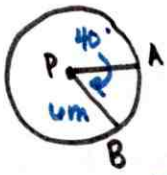
10)



$C = \pi d$
$d = 10/2$
$d = 5$
$C = 5\pi$ 15.7

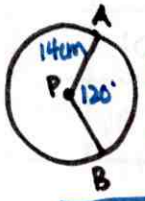
Find the length of $\overset{\frown}{AB}$.

11)



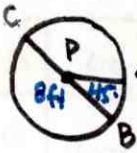
$\frac{x}{2\pi(6)} = \frac{40°}{360°}$
$360x = 40(12\pi)$
Length $\overset{\frown}{AB} = 4.2$m

12)



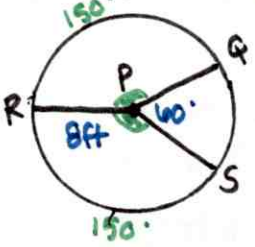
$\frac{x}{2\pi(14)} = \frac{120°}{360°}$
$360x = 120(28\pi)$
Length $\overset{\frown}{AB} = 29.3$cm

13)



$\frac{x}{2\pi(4)} = \frac{45°}{360°}$
$360x = 45(8\pi)$
Length $\overset{\frown}{AB} = 3.1$ ft

In $\odot P$, $\angle QPR \cong \angle RPS$. Find the indicated measures.



15) m $\overset{\frown}{QRS}$ $= 360 - 60$
$= 300°$

16) Length $\overset{\frown}{QRS}$
$\frac{x}{2\pi(8)} = \frac{300°}{360°}$
$360x = 300(16\pi)$
$x = 41.9$ ft

17) m $\overset{\frown}{QR}$ $= \frac{360-60}{2}$
$= 150°$

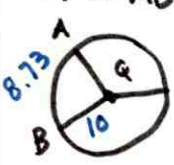
18) m $\overset{\frown}{RSQ}$
$= 150 + 60$
$= 210°$

19) Length $\overset{\frown}{QR}$
$\frac{x}{2\pi(8)} = \frac{150°}{360°}$
$360x = 150(16\pi)$
$x = 20.9$ ft

20) Length $\overset{\frown}{RSQ}$
$\frac{x}{2\pi(8)} = \frac{210°}{360°}$
$360x = 210(16\pi)$
$x = 29.3$ ft

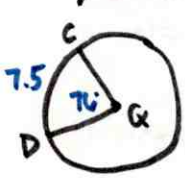
Find the indicated measure.

21) m $\overset{\frown}{AB}$



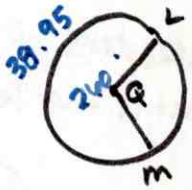
$\frac{8.73}{2\pi(10)} = \frac{x}{360°}$
$\frac{(20\pi)x}{(20\pi)} = \frac{360(8.73)}{(20\pi)}$
m $\overset{\frown}{AB} = 50°$

22) Circumference of $\odot Q$



$\frac{7.5}{x} = \frac{76°}{360°}$
$\frac{76x}{76} = \frac{360(7.5)}{76}$
$C = 35.5$ units

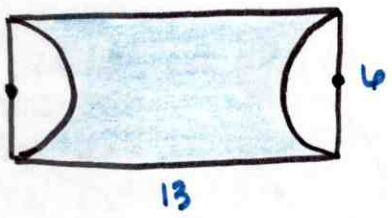
23) Radius of $\odot Q$



$\frac{38.95}{x} = \frac{240}{360}$
$240x = 360(38.95)$
$C = 53.9$
$\frac{53.9}{(2\pi)} = \frac{2\pi r}{(2\pi)}$
$r = 8.6$

Find the perimeter of the shaded region.

24)



P(Rectangle) + Circumference (circle) − 2(6)

$\ell = 13$ $w = 6$

$P = 2\ell + 2w$

$P = 2(13) + 2(6)$

$P = 38$

OR just 2(13)

$d = 6$

$C = \pi d$

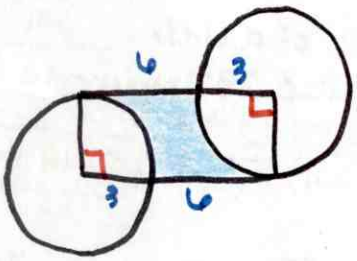
$C = 6\pi$

$C = 18.8$

$P = 38 + 18.8 - 12$

$\boxed{P = 44.8 \text{ units}}$

25)



$\frac{1}{4}$(circumference) + $\frac{1}{4}$(circumference) + 2(6)

$r = 3$ $r = 3$ 12

$\frac{1}{4}(2\pi(3))$ $\frac{1}{4}(2\pi(3))$

4.7 4.7

OR $\frac{1}{2}$(circumference)

$P = 4.7 + 4.7 + 12$

$\boxed{P = 21.4 \text{ units}}$

30)

Radius	5.1	2	0.8	4.2	2.1	$4\sqrt{2}$
$m\overset{\frown}{AB}$	45°	60°	21.5°	183°	90°	29°
Length $\overset{\frown}{AB}$	4	2.1	0.3	13.4	3.22	2.86

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

① $\frac{4}{2\pi r} = \frac{45}{360}$

$\frac{45(2\pi r)}{(45(2\pi))} = \frac{360(4)}{(45(2\pi))}$

(90π)

② $\frac{x}{2\pi(2)} = \frac{60^\circ}{360^\circ}$

$\frac{360x}{360} = \frac{60(4\pi)}{360}$

③ $\frac{.3}{2\pi(.8)} = \frac{x}{360}$

$\frac{(1.6\pi)x}{(1.6\pi)} = \frac{360(.3)}{(1.6\pi)}$

④ $\frac{x}{2\pi(4.2)} = \frac{183^\circ}{360}$

$\frac{360x}{360} = \frac{183(6.4\pi)}{360}$

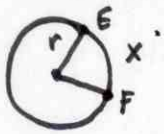
⑤ $\frac{3.22}{2\pi r} = \frac{90}{360}$

$\frac{90(2\pi r)}{(90(2\pi))} = \frac{360(3.22)}{(90(2\pi))}$

⑥ $\frac{2.86}{2\pi(4\sqrt{2})} = \frac{x}{360}$

$\frac{x(8\sqrt{2}\pi)}{(8\pi\sqrt{2})} = \frac{360(2.86)}{(8\pi\sqrt{2})}$

31) Suppose $\overset{\frown}{EF}$ was an arc on a circle w/ a radius r. Let x° be the $m\overset{\frown}{EF}$. Describe the effect on the length of $\overset{\frown}{EF}$ if you a) double the radius of the circle, and b) double the measure of $\overset{\frown}{EF}$.



Example:
$r = 3$
$x = 40^\circ$

original

$\frac{x}{2\pi(3)} = \frac{40}{360}$

$360x = 40(6\pi)$

Length $\overset{\frown}{EF} = 2.1$

a) $r = 6$, $x = 40^\circ$

$\frac{x}{2\pi(6)} = \frac{40}{360}$

$360x = 40(12\pi)$

$\boxed{\text{Length } \overset{\frown}{EF} = 4.2}$ ×2

b) $r = 3$ $x = 80^\circ$

$\frac{x}{2\pi(3)} = \frac{80}{360}$

$360x = 80(6\pi)$

$\boxed{\text{Length } \overset{\frown}{EF} = 4.2}$ ×2

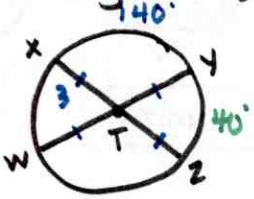
Effect

When you double the radius or the measure of the arc, the length of the arc is doubled

32) $\overline{WY}$ and $\overline{XZ}$ are diameters of ⊙T, and $WY = XZ = 6$. If the $m\overset{\frown}{XY} = 140^\circ$, what is the length of $\overset{\frown}{YZ}$?

[A] $\frac{2}{3}\pi$ [B] $\frac{4}{3}\pi$

[C] 6π [D] 4π



$m\overset{\frown}{YZ} = 180 - 140$

$m\overset{\frown}{YZ} = 40^\circ$

$\frac{x}{2\pi(3)} = \frac{40^\circ}{360^\circ}$

$\frac{360x}{360} = \frac{40(6\pi)}{360}$

$x = \frac{2\pi}{3}$