Lesson 8.5 • Areas of Circles

Name _____ Period _____ Date _____

In Exercises 1–4, write your answers in terms of π.

1. If $r = 9$ cm, $A =$ 81π cm^2

$A=\pi r^2$
$=\pi 81$

2. If $d = 6.4$ cm, $A =$ 10.24π cm^2

$A=\pi r^2$ $r=3.2$
$A=\pi(3.2)^2$

3. If $A = 529\pi$ cm^2, $r =$ 23cm

$529\pi=\pi r^2$
$529=r^2$

4. If $C = 36\pi$ cm, $A =$ 324 cm^2

$C=2r\pi$
$2\pi \;/\; 36\pi=2r\pi/2\pi$
$18=r$
$A=18^2\pi =$

In Exercises 5–8, round your answers to the nearest 0.01 unit.

5. If $r = 7.8$ cm, $A \approx$ 191.13cm

$A=\pi r^2$

6. If $A = 136.46$, $C \approx$ 41.34

$A=\pi r^2$ $r^2=43.29$ $C=2r\pi$
$\frac{136.46}{\pi}=\frac{\pi r^2}{\pi}$ $r=6.57$

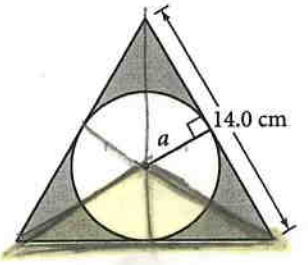
7. If $d = 3.12$, $A \approx$ 7.65

$d=2r$ $A=(1.56)^2\pi$
$r=1.56$

8. If $C = 7.85$, $A \approx$ 4.90

$C=2\pi r$ $r=1.25$
$\frac{7.85}{2\pi}=\frac{2\pi r}{2\pi}$ $A=\pi r^2$

For Exercises 9 and 10, refer to the figure of a circle inscribed in an equilateral triangle. Round your answers to the nearest 0.1 unit.



$a \approx 4.04$ cm

9. Find the area of the inscribed circle.

$A=\pi r^2$ $A=(4.04)^2\pi$ $A=51.28\text{cm}^2$

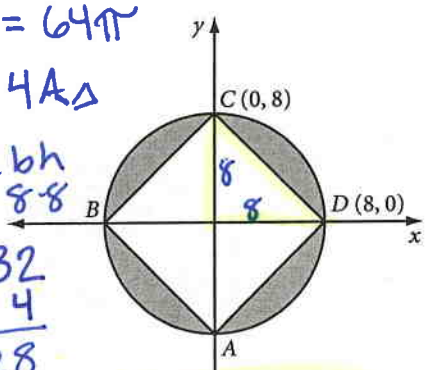
10. Find the area of the shaded region.

$A=\Delta-O$ $A_\Delta=3(\frac{1}{2}bh)$ $A_O=51.28$
$=3(\frac{1}{2})(14)(4.04)=84.84$ $A_{\Delta-O}=33.56\text{cm}^2$

In Exercises 11 and 12, find the area of the shaded region. Write your answers in terms of π.

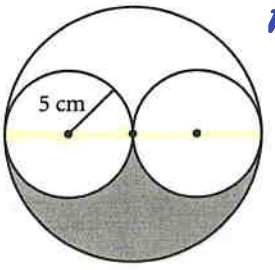
11. *ABCD* is a square.

$A_O=64\pi$
$A_\square=4A_\Delta$
$A_\Delta=\frac{1}{2}bh$
$=\frac{1}{2}\,8\cdot 8$
$=32$
$A_\square=32\times 4$
128



$A=A_O-A_\square=64\pi-128$

12. The three circles are tangent.



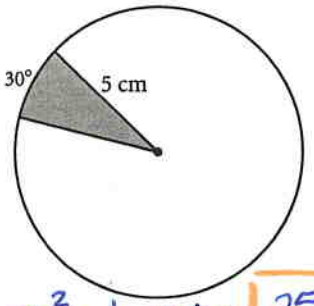
$A=$ ▭ $-$ ○ $-$ ○ $=0$
$R=10$ $A_\bigcirc=\frac{1}{2}10^2\pi$
$=50\pi$
$A_\bigcirc=\pi 5^2=25\pi$
$A=50\pi-25\pi$
$=25\pi$

Lesson 8.6 • Any Way You Slice It

Name _____ Period _____ Date _____

In Exercises 1–6, find the area of the shaded region. Write your answers in terms of π and rounded to the nearest 0.01 cm^2.

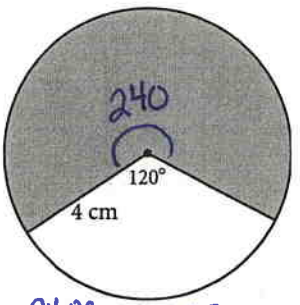
1.



$A = \frac{30}{360}\pi r^2 = \frac{1}{12}\cdot 25\pi = \frac{25\pi}{12}\ cm^2$

$= 6.54\ cm^2$

2.

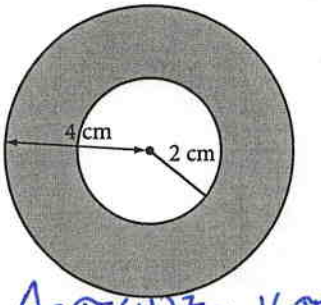


$\frac{240°}{360°}\cdot\pi\cdot 4^2$

$\frac{2}{3}\cdot 16\pi = \frac{32\pi}{3}\ cm^2$

$= 33.51\ cm^2$

3.



$A = \pi(4)^2 = 16\pi$

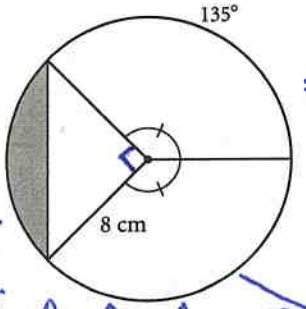
$a = \pi(2)^2 = 4\pi$

$Area = A - a = 16\pi - 4\pi$

$= 12\pi\ cm^2$

$= 37.70\ cm^2$

4.



$360 - 135 = 225$

-135

$x = 90°$

$\frac{90}{360}\cdot\pi 8^2$

$= \frac{1}{4}\cdot 64\pi = 16\pi$

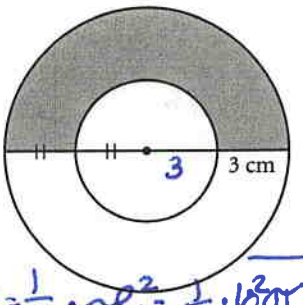
$A = \triangle + \triangle = \smile$

$\frac{1}{2}\cdot 8\cdot 8 = 32$

$A = (16\pi - 32)\ cm^2$

$A = 18.27\ cm^2$

5.



$\frac{1}{2}$ ⌒ $-\frac{1}{2}$ ⌒

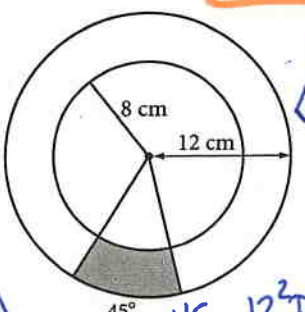
$A = \frac{1}{2}\cdot\pi R_1^2 = \frac{1}{2}\cdot 6^2\pi = 18\pi$

$a = \frac{1}{2}\pi r^2 = \frac{1}{2}3^2\pi = \frac{9}{2}\pi$

$Area = \left(18 - \frac{9}{2}\right)\pi = \frac{27\pi}{2}\ cm^2$

$= 42.41\ cm^2$

6.



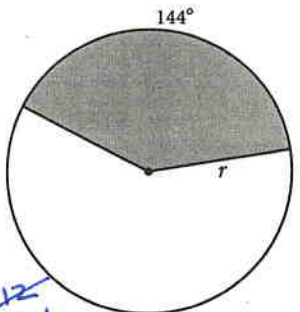
△ − △

$A = \frac{45}{360}\cdot 12^2\pi = \frac{1}{8}\cdot 144\pi = 18\pi$

$a = \frac{45}{360}\cdot 8^2\pi = \frac{1}{8}\cdot 64\pi = 8\pi$

$Area = 10\pi\ cm^2 = 31.42\ cm^2$

7. Shaded area is 40π cm^2. Find r.



$A = 40\pi$

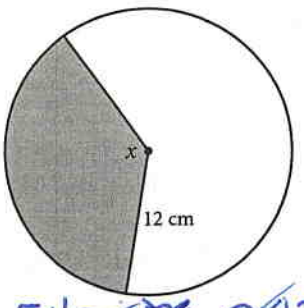
$A = \frac{144}{360}\cdot\pi r^2$

$\frac{5}{2\pi}\cdot 40\pi = \frac{2}{5}\pi r^2\cdot\frac{5}{2\pi}$

$100 = r^2$

$10\ cm = r$

8. Shaded area is 54π cm^2. Find x.

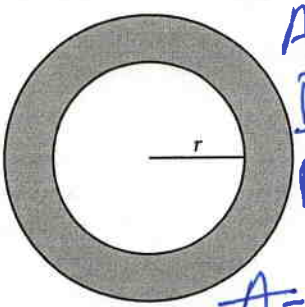


$54\pi = \frac{x}{360}\cdot\pi 12^2$

$\frac{5}{2}\cdot 54 = \frac{x}{360}\cdot 144\cdot\frac{5}{2}$

$X = 135°$

9. Shaded area is 51π cm^2. The diameter of the larger circle is 20 cm. Find r.



$A = 51\pi$

$D = 20$

$R = 10$

$A = 10^2\pi$

$Area = A - a$

$a = r^2\pi$

$51\pi = 100\pi - r^2\pi$

$-100\pi \quad -100\pi$

$-49 = -r^2$

$r^2 = 49$

$r = 7\ cm$