\# 9 apothem $=7$

$$
\text { perimeter }=56
$$

$$
\begin{aligned}
& A=\frac{1}{2} a P \\
& A=\frac{1}{2}(7)(56) \\
& A=192
\end{aligned}
$$

Find Area
\#13 Find the area of each shaded region
a.

b

c.


$$
\begin{aligned}
& A_{\odot}=36 \pi \\
& A_{\text {Sec }}=\frac{1}{4} \cdot 36 \pi=9 \pi
\end{aligned}
$$

$A_{B I g}=25 \pi$

$$
A_{D}=100
$$

$A_{\text {SmalL }}=9 \pi$

$$
A_{0}=25 \pi
$$

$A_{\text {shad }}=100-25 \pi$
\#14 Find the area of each sector
a.

b


$$
\begin{aligned}
& A=\frac{1}{6} 144 \pi \\
& A=24 \pi
\end{aligned}
$$

$$
A=\frac{1}{9} \cdot 144 \pi
$$

$$
A=\frac{1}{36} \cdot 144 \pi
$$

$A=16 \pi$

$$
A=4 \pi
$$

\#24 Find the area of the regular hexagon


$$
\frac{x \sqrt{3}}{\sqrt{3}}=\frac{18}{\sqrt{3}}
$$

$$
x=6 \sqrt{3}
$$

\#25 Find the area of the shaded region in each figure.
a.


$$
\begin{aligned}
\frac{8}{x} & =\frac{10}{4}
\end{aligned} \quad A=\frac{1}{2}(8)(10)
$$



$$
\begin{aligned}
& A=\frac{1}{2} a P \\
& A=\frac{1}{2}(18)(72 \sqrt{3}) \\
& A=648 \sqrt{3}
\end{aligned}
$$

b.


$$
A_{\Delta}=\frac{(6 \sqrt{3})^{2} \sqrt{3}}{4}
$$

$$
\Delta_{\Delta}=\frac{36.3 \sqrt{3}}{4}
$$

$$
A_{\Delta}=27 \sqrt{3}
$$

$C$


$$
A_{0}=\frac{1}{2}(4)(3)
$$

$$
A_{\Delta}=6
$$

$$
A_{\text {shad }}=6-\pi
$$

\#26 Ratio of whole to shaded $\quad A_{\text {shad }}=27 \sqrt{3}-9 \pi$
a.

$b$

c.

similar
$\frac{A_{\text {whole }}}{A_{\text {shad }}}=\frac{\frac{1}{2}\left(\frac{21}{5}\right) \cdot h}{\frac{V}{2}(3) \cdot K}=\frac{7}{5}$
$5 x=6$
$x=\frac{6}{5}$
\#27 Find the area of each shaded segment
a.


$$
A_{\odot}=36 \pi
$$

$$
A_{\text {sec }}=\frac{1}{4} .36 \pi=9 \pi
$$

$$
A_{\text {seq }}=9 \pi-18
$$

b.


$$
A \Delta=\frac{6.6}{2}=18
$$

$$
\begin{aligned}
& A_{\odot}=36 \pi \\
& A_{\text {sec }}=\frac{1}{6} \cdot 36 \pi=6 \pi \\
& A_{\Delta}=\frac{6^{2} \sqrt{3}}{4}=9 \sqrt{3} \\
& A_{\text {see }}=6 \pi-9 \sqrt{3}
\end{aligned}
$$

\#28 Find the ratio of areas
a.


$$
\left(\frac{8}{18}\right)^{2}=\left(\frac{4}{9}\right)^{2}=\frac{16}{81}
$$

b.


$$
\left(\frac{6}{9}\right)^{2}=\left(\frac{2}{3}\right)^{2}=\frac{4}{9}
$$

c.

\#32 Find the area of region I to region II
$a$.


$$
\frac{A_{\text {II }}}{A_{I+\text { II }}}=\left(\frac{6}{9}\right)^{2}=\left(\frac{2}{3}\right)^{2}=\frac{4}{9}
$$

If there are 9 total parts (i nwhole triangle), II has 4 parts and I must have 5 parts

$$
\therefore 5: 4
$$

\#35


Five tangents circles.
small: $r=3$
Find shaded area

$$
\begin{aligned}
\frac{x \sqrt{2}}{\sqrt{2}} & =\frac{6}{\sqrt{2}} \\
x & =3 \sqrt{2}
\end{aligned}
$$



$$
\begin{aligned}
A_{\text {small }} & =\pi(3)^{2}=9 \pi \\
A_{\text {Large }} & =(3+3 \sqrt{2})^{2} \pi \\
& =(9+18 \sqrt{2}+18) \pi \\
& =18 \sqrt{2} \pi+27 \pi \\
A_{\text {shad }} & =18 \sqrt{2} \pi+27 \pi-9 \pi \\
& =18 \sqrt{2 \pi}-9 \pi
\end{aligned}
$$

\#36 Fund the shaded areas
a.

picture $\rightarrow$
the whole $\mathcal{O}$

$$
\begin{aligned}
& A_{\Delta}=\frac{10^{2} \sqrt{3}}{4}=25 \sqrt{3} \\
& A_{\text {sec }}=\frac{1}{6} \cdot 100 \pi=\frac{50 \pi}{3} \\
& A_{\text {seg }}=\frac{50 \pi}{3}-25 \sqrt{3}
\end{aligned}
$$

$$
\begin{aligned}
A_{\text {shad }} & =25 \sqrt{3}-3\left(\frac{50 \pi}{3}-25 \sqrt{3}\right) \\
& =25 \sqrt{3}-50 \pi+75 \sqrt{3} \\
& =100 \sqrt{3}-50 \pi
\end{aligned}
$$

b.


Area of sector $+\Delta$

$$
\begin{aligned}
& A_{\text {sec }}=\frac{1}{6} \cdot 36 \pi=6 \pi \\
& A_{\Delta}=\frac{6 \sqrt{3} \cdot 3}{2}=9 \sqrt{3} \\
& A_{\text {shad }}=6 \pi+9 \sqrt{3}
\end{aligned}
$$

\#40 Archibold Left his horse, Gremilda, tied to the comer of a $\beta$ ain by a $12-\mathrm{m}$ rope The Barn measures 8 m by 90 m . Fund the total grazing area for Gremilda

$$
\begin{array}{ll}
\text { Ared }=\frac{3}{4}(12)^{2}=108 \pi & \\
\text { A burse }=\frac{1}{4}(2)^{2}=\pi & \text { total } \\
\text { A green }=\frac{1}{4}(4)^{2}=4 \pi & \text { 113\% }
\end{array}
$$



