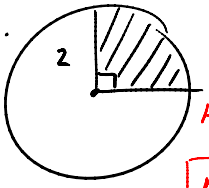
Sec 11.6 pgs. 539 - 541 #5ace, 8 - 11, 15, 18
pgs. 540 - 542 #12, 14, 19 - 22

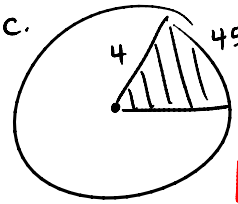
#5 Find the area of the shaded sector

a. 

$A = \frac{90}{360} \cdot \pi(2)^2$

$A = \frac{1}{4} \cdot 4\pi$

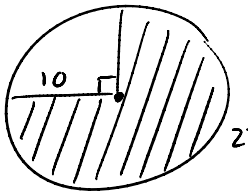
$A = \pi u^2$

c. 

$A = \frac{45}{360} \cdot \pi(4)^2$

$A = \frac{1}{8} \cdot 16\pi$

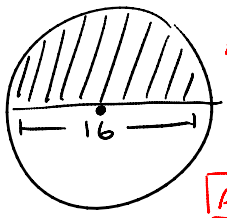
$A = 2\pi u^2$

e. 

$A = \frac{270}{360} \cdot \pi(10)^2$

$= \frac{3}{4} \cdot 100\pi$

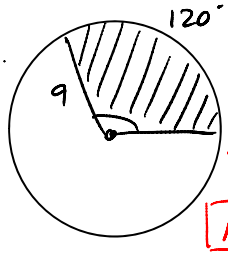
$= 75\pi u^2$

b. 

$A = \frac{180}{360} \cdot \pi 8^2$

$A = \frac{1}{2} \cdot 64\pi$

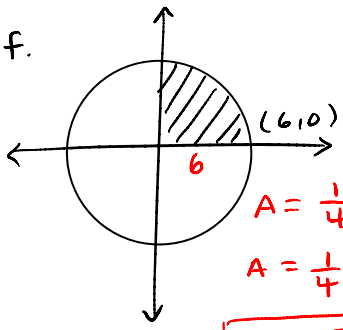
$A = 32u^2$

d. 

$A = \frac{120}{360} \cdot \pi(9)^2$

$A = \frac{1}{3} \cdot 81\pi$

$A = 27\pi u^2$

f. 

$A = \frac{1}{4} \cdot \pi(6)^2$

$A = \frac{1}{4} \cdot 36\pi$

$A = 9\pi u^2$

1

#8 Find to the nearest tenth, the radii of circles w/ the following areas

a. 24π

$A = \pi r^2$

$\frac{24\pi}{\pi} = \frac{\pi r^2}{\pi}$

$24 = r^2$

$2\sqrt{6} = r$

$r \approx 4.9$

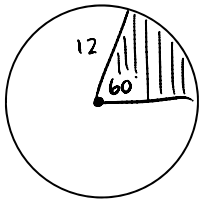
b. 36

$\frac{36}{\pi} = \frac{\pi r^2}{\pi}$

$\sqrt{\frac{36}{\pi}} = \sqrt{r^2}$

$3.4 \approx r$

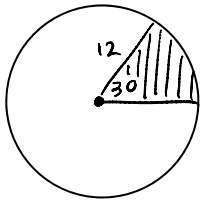
#9 Find the area of each SECTOR

a. 

$A = \frac{60}{360} \cdot (12)^2 \pi$

$= \frac{1}{6} \cdot 144\pi$

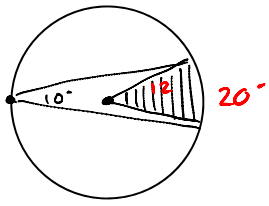
$= \boxed{24\pi}$

b. 

$A = \frac{30}{360} \cdot 144\pi$

$= \frac{1}{12} \cdot 144\pi$

$= \boxed{12\pi}$

c. 

$A = \frac{20}{360} \cdot 144\pi$

$= \frac{1}{18} \cdot 144\pi$

$= \boxed{8\pi}$

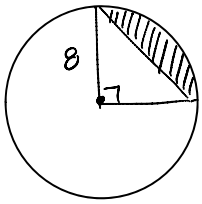
#10 If the area of the CIRCLE is 60π and the area of a SECTOR of the CIRCLE is 24π, what is the measure of the SECTOR's arc

$A_{sec} = \frac{m\overset{\frown}{arc}}{360} \cdot A_{whole}$

$360 \cdot 24\pi = \frac{m\overset{\frown}{arc}}{360} \cdot 60\pi \cdot 360$

$\frac{8640\pi}{60\pi} = \frac{m\overset{\frown}{arc} \cdot 60\pi}{60\pi}$

$\boxed{144 = m\overset{\frown}{arc}}$

#11 a. 

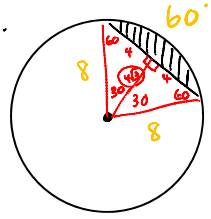
$A_O = 64\pi$

$A_{sec} = \frac{1}{4} \cdot 64\pi$

$= 16\pi \text{ u}^2$

$A_\Delta = \frac{8 \cdot 8}{2} = 32 \text{ u}^2$

$A_{shad} = \boxed{16\pi - 32 \text{ u}^2}$

b. 

$A_O = 64\pi$

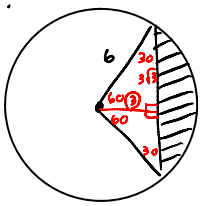
$A_{sec} = \frac{60}{360} \cdot 64\pi$

$= \frac{1}{6} \cdot 64\pi$

$= \frac{32\pi}{3}$

$A_\Delta = \frac{8 \cdot 4\sqrt{3}}{2} = \frac{32\sqrt{3}}{2} = 16\sqrt{3}$

$A_{shad} = \frac{32\pi}{3} - 16\sqrt{3}$

c. 

$A_O = 36\pi$

$A_{sec} = \frac{120}{360} \cdot 36\pi$

$= \frac{1}{3} \cdot 36\pi$

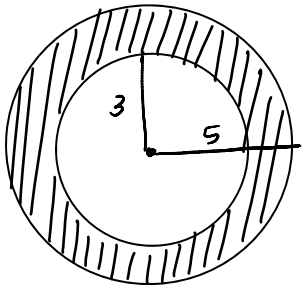
$= 12\pi$

$A_\Delta = \frac{6\sqrt{3} \cdot 3}{2}$

$= 9\sqrt{3}$

$A_{shad} = 12\pi - 9\sqrt{3}$

#12 Find the AREA of the shaded figure. (annulus)



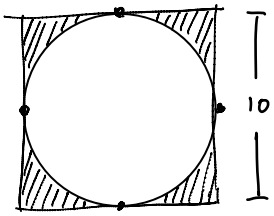
$A_{Big} = \pi(5)^2$
$= 25\pi$

$A_{small} = \pi(3)^2$
$= 9\pi$

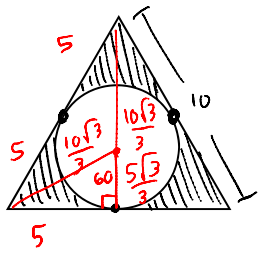
$A_{shad} = 25\pi - 9\pi = \boxed{16\pi\ u^2}$

#14

a.



b.



$A_{\triangle} = \frac{10^2\sqrt{3}}{4}$

$= 25\sqrt{3}$

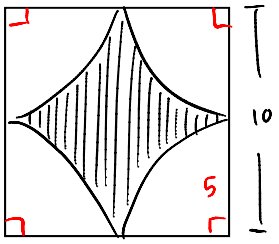
$A_{\circ} = \pi\left(\frac{5\sqrt{3}}{3}\right)^2$

$= \pi \cdot \frac{25 \cdot 3}{9}$

$= \frac{25\pi}{3}$

$A_{shad} = \boxed{25\sqrt{3} - \frac{25\pi}{3}\ u^2}$

c.

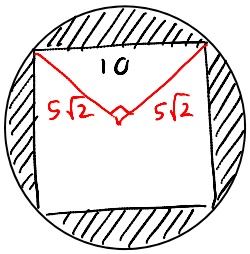


$A_{\square} = 100\ u^2$

$A_{\odot} = \pi(5)^2 = 25\pi$

$A_{shad} = \boxed{100 - 25\ u^2}$

e.



$x\sqrt{2} = 10$

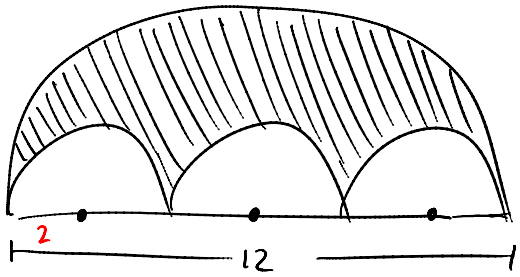
$x = 5\sqrt{2}$

$A_{\odot} = \pi(5\sqrt{2})^2$
$= \pi \cdot 25 \cdot 2$
$= 50\pi$

$A_{\square} = 10 \cdot 10$
$= 100$

$A_{shad} = \boxed{50\pi - 100\ u^2}$

#15

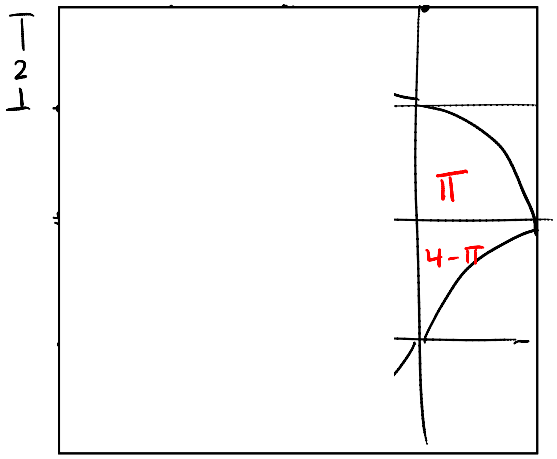


$A_{Big} = \pi(6)^2 = 36\pi/2 = 18\pi$

$A_{small} = \pi(2)^2 = 4\pi/2 = 2\pi \times 3 = 6\pi$

$A_{shad} = 18\pi - 6\pi = \boxed{12\pi u^2}$

#17



$A_{\square} = 2 \cdot 2 = 4$

$A_{(quarter\ \odot)} = \frac{1}{4} \cdot \pi(2)^2$

$= \frac{4\pi}{4}$

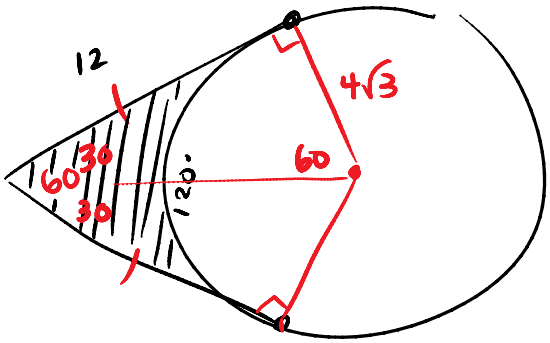
$= \pi$

(add up...

$\boxed{A = 32u^2}$

#18 Find the area of the shaded region

a.



$\frac{x\sqrt{3}}{\sqrt{3}} = \frac{12}{\sqrt{3}}$

$x = 4\sqrt{3}$

$A_{\Delta} = \frac{4\sqrt{3} \cdot 12}{2} = 24\sqrt{3}$

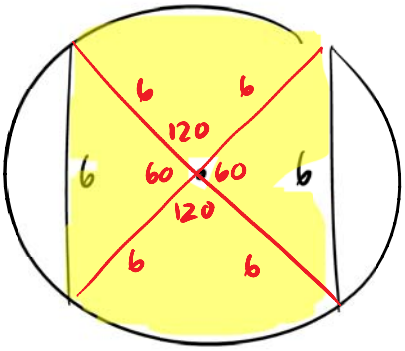
$A_{2\Delta's} = 48\sqrt{3}$

$A_{sec} = \frac{1}{3} \cdot \pi(4\sqrt{3})^2$

$= 16\pi$

$\boxed{A_{shad} = 48\sqrt{3} - 16\pi}$

b.



Diam = 12

$A_{sec} = \frac{1}{3} \cdot \pi(6)^2$

$= 36\pi/3 = 12\pi$

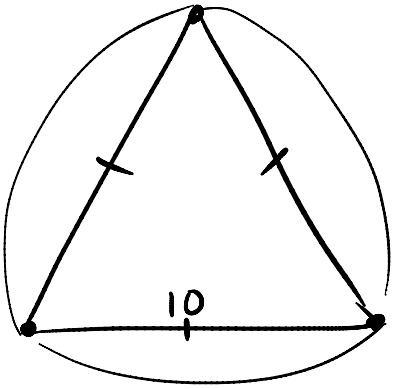
$A_{\Delta} = \frac{6^2\sqrt{3}}{4} = 9\sqrt{3}$

$A_{shad} = 2(12\pi) + 2(9\sqrt{3})$

$= \boxed{24\pi + 18\sqrt{3}}$

#19 A rotor of a Wankel automotive engine has the geometric shape shown. The center of each arc it the opposite vertex of the equilateral triangle.

a. Find the figure's area.



$A_\Delta = \frac{10^2\sqrt{3}}{4} = 25\sqrt{3}$

$A_{sec} = \frac{1}{6}\cdot\pi(10)^2 = \frac{50\pi}{3}$

$A_{sec} = \frac{50\pi}{3} - 25\sqrt{3}$

$A_{total} = 25\sqrt{3} + 3\left(\frac{50\pi}{3} - 25\sqrt{3}\right)$

$= 25\sqrt{3} + 50\pi - 75\sqrt{3}$

$\boxed{50\pi - 50\sqrt{3}}$

b. Find the figures perimeter

$C = \pi d$

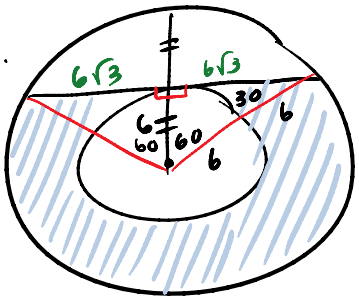
$C = 20\pi$

$Arc\ length = \frac{1}{6}\cdot 20\pi = \frac{10\pi}{3}$

$P = 3\left(\frac{10\pi}{3}\right) = \boxed{10\pi}$

#20 Find the area of each shaded region

a.



$A_{shad} = A_{Big} - A_{small} - A_{seg}$

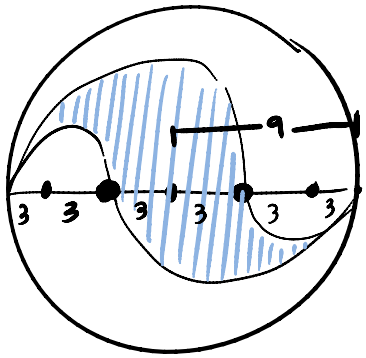
$A_{Big} = \pi(12)^2 = 144\pi$

$A_{small} = \pi(6)^2 = 36\pi$

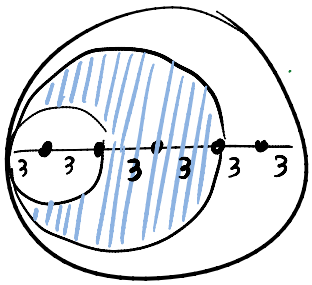
$A_{seg} = \frac{1}{3}(12)^2\pi = \frac{144\pi}{3} - 36\sqrt{3}$

$A_{shad} = 144\pi - 36\pi - \left(\frac{144\pi}{3} - 36\sqrt{3}\right) = \boxed{60\pi + 36\sqrt{3}}$

b.



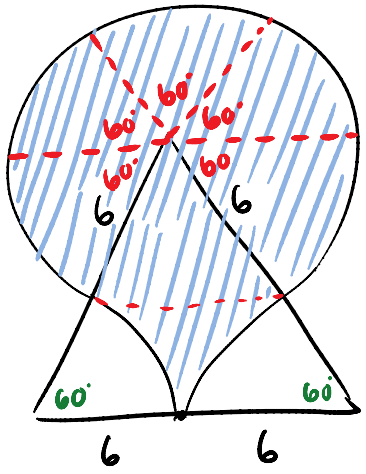
same as →



$A_{shad} = 36\pi - 9\pi$

$= \boxed{27\pi}$

c.



$A_{\odot} = \pi(6)^2$
$= 36\pi$

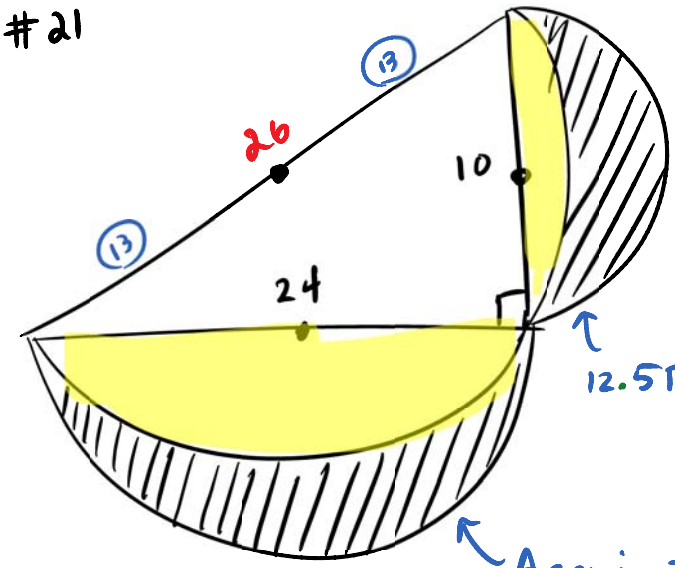
$A_{5\text{ sectors}} = \frac{5}{6}(36\pi) = 30\pi$

$A_{\Delta} = \frac{12^2\sqrt{3}}{4} = \frac{144\sqrt{3}}{4} = 36\sqrt{3}$

$A_{sec} = 6\pi$

$A_{shad} = 30\pi - 6\pi - 6\pi - 36\sqrt{3}$
$= \boxed{18\pi + 36\sqrt{3}}$

#21



$A_{Big\odot} = \pi(13)^2 = 169\pi = 84.5\pi$

$A_{\Delta} = \frac{24 \cdot 10}{2} = 120$

$A_{yel} = 84.5\pi - 120$

12.5π

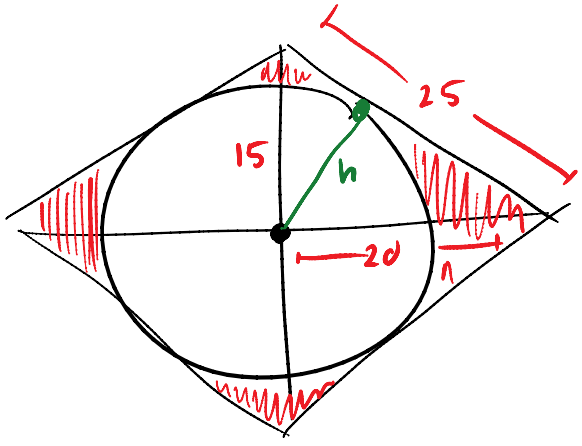
$A_{semi} = 72\pi$

Two semis $= 84.5\pi$

$A_{shad} = 84.5\pi - (84.5\pi - 120)$

$A_{shad} = \boxed{120}$

#22



$A_{rhom} = \frac{30 \cdot 40}{2} = 600$

$A_{\Delta} = \frac{20 \cdot 15}{2} = 150$

$150 = \frac{25 \cdot h}{2}$

$\boxed{h = 12}$

$A_{\odot} = 144\pi$

$\boxed{A_{shad} = 600 - 144\pi}$