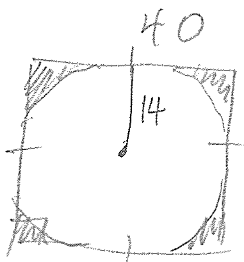
Areas of sectors — "homework"

(12) $A_{rectangle} + A_{semi} = A_{region}$

$12(15) + \frac{1}{2}(3.14 \cdot 6^2) =$

$180 + 56.52 \Rightarrow \approx \boxed{237 \text{ sq. feet}}$

(15)



$A_{SQ} - A_{\odot} = A_{\text{not used}}$

$\pi 14^2$

$(40)^2 - (\frac{22}{7})(14^2) = \boxed{984 \text{ sq.}}$

$1600 - 616$

(20) $C = 42\pi = \frac{42^6}{1} \cdot \frac{22}{7} = 132$ ft per rotation

$\frac{4 \text{ min} \times 60 \text{ sec}}{20 \text{ sec}} = 12$ rotations

$132 \times 12 = \boxed{1,584 \text{ feet}}$

(25) Region A = Region C

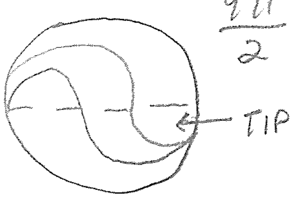
$\frac{1}{2} \cdot A_{whole \odot} - \frac{1}{2}(A_B) + \frac{1}{2}(A_{tip}) = A_A$

$\frac{1}{2}(\pi \cdot 3^2) - \frac{1}{2}(\pi \cdot 2^2) + \frac{1}{2}(\pi 1^2) = A_A$

$\frac{9\pi}{2} - \frac{4\pi}{2} + \frac{\pi}{2} = A_A$

$\frac{6\pi}{2} = A_A$

$3\pi = A_A = A_C$



$A_{whole} - 2(A_A) = A_B$

$9\pi - 2(3\pi) = A_B$

$9\pi - 6\pi$

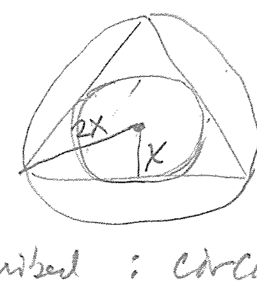
$\boxed{3\pi = A \text{ of region B}}$

(26) $A_{rect.} - A_{circles} = A_{shaded}$

$12(24) - 2(\pi 6^2)$

$\boxed{288 - 72\pi} = A_{shaded}$

(30)



Inscribed : circumscribed

$\pi x^2 : \pi(2x)^2$

$x^2 : 4x^2$

1 : 4

(15) $A_{\odot} - A_{sector} + A_{\triangle} = A_{shaded}$

$\pi 4^2 - \frac{1}{4}(\pi 4^2) + \frac{1}{2}(4)(4) =$

$16\pi - 4\pi + 8 =$

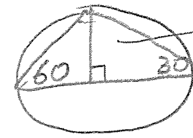
$\boxed{12\pi + 8} = A_{shaded}$

(16) $A_{\frac{1}{2}\odot} - A_{\triangle} = A_{sh.}$

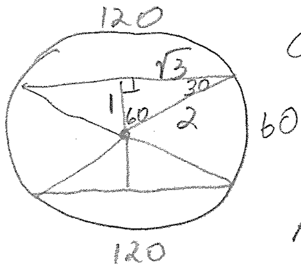
$\frac{1}{2}(\pi 6^2) - \frac{1}{2}(12)(3\sqrt{3}) =$

$\boxed{18\pi - 18\sqrt{3}} = A_{sh.}$

use 30-60-90 to find height of $\triangle$



(17)



chords $\cong$.

$A_{\odot} = \pi 2^2$
$= 4\pi$

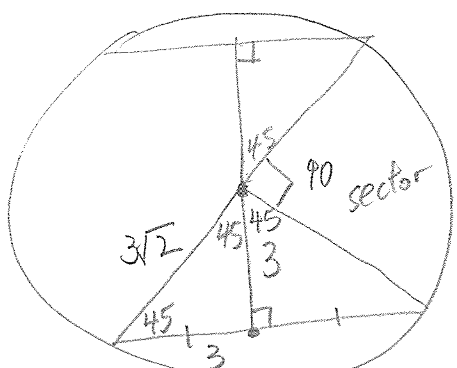
$2(A_{sector}) + 2A_{\triangle s} = A_{sh.}$

$2\left(\frac{60}{360} \cdot 4\pi\right) + 2\left(\frac{1}{2} \cdot 2\sqrt{3} \cdot 1\right) =$

$\boxed{\frac{4\pi}{3} + 2\sqrt{3}} = A_{sh.}$

or $\boxed{\frac{4\pi + 6\sqrt{3}}{3}}$

(18)



$r = 3\sqrt{2}$ $A_{\odot} = \pi(3\sqrt{2})^2$
$= 18\pi$

$2(A_{sector}) + 2(A_{\triangle}) = A_{shaded}$

$2\left(\frac{90}{360} \cdot 18\pi\right) + \cancel{2}\left(\cancel{\frac{1}{2}} \cdot (6)(3)\right) =$

$\cancel{2}\left(\frac{1}{\cancel{4}_2} \cdot 18\pi\right) + 18$

$\boxed{9\pi + 18} = A_{sh.}$

(21) a) $m\angle AOX = 49$
$m\angle AOB = 98$

b) 52 sq cm

(22) fair : foul

(Shaded region is $\frac{1}{4}$ of a circle. So, $A = \pi\, 325^2$, $A_{circle} = 105{,}625\pi$)

$\frac{1}{4}(A_{circle}) : 2(A_{rect}) + \frac{1}{4}(circle)$

$\frac{1}{4}(105{,}625\pi) : 2(60 \cdot 325) + \frac{1}{4}(\pi\, 60^2)$

$\frac{105{,}625(3.14)}{4} : 39{,}000 + 900\pi$

$\approx 82{,}916 : 41{,}826$

$\boxed{\approx 2 : 1}$

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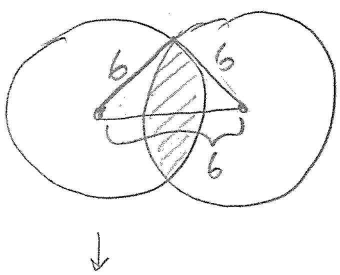
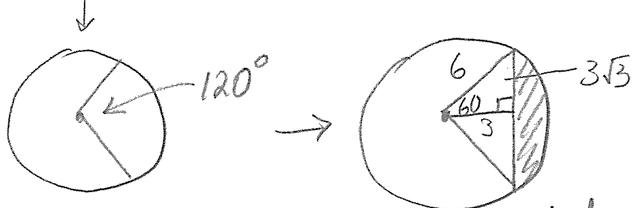
(25)



Have an equilateral Δ. Each $m\angle = 60°$.



Find shaded of 1 ⊙ & double it.

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

$A_{sector} - A_{\Delta} = A_{\frac{1}{2}shaded}$

$\frac{120}{360}(36\pi) - \frac{1}{2}(6\sqrt{3})(3) =$

$\frac{1}{3}(36\pi) - 3\sqrt{3}(3) =$

$12\pi - 9\sqrt{3} = A_{\frac{1}{2}shaded}$

$2(12\pi - 9\sqrt{3}) =$

$\boxed{24\pi - 18\sqrt{3} = A_{shaded}}$

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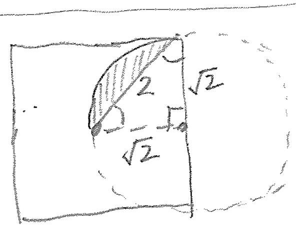
(26)



Find area of a sliver. Then double to form a leaf. Then quadruple it.

$A_{\odot} = \pi \sqrt{2}^2 = 2\pi$

$A_{sector} - A_{\Delta} = A_{\frac{1}{2}leaf}$

$\frac{1}{4}(2\pi) - \frac{1}{2}\sqrt{2} \cdot \sqrt{2} =$

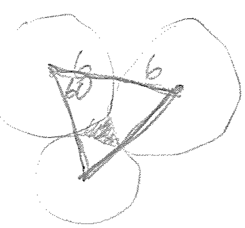
$\frac{1}{2}\pi - 1 = A_{half\ leaf}$

$2(\frac{1}{2}\pi - 1) =$

$\pi - 2 = A_{leaf}$

$\boxed{4\pi - 8 = A_{shaded}}$

(28)



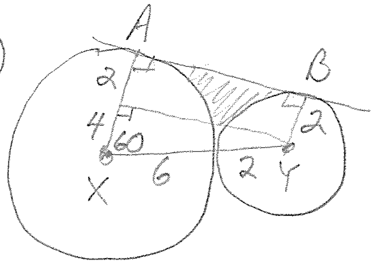
$$\text{Area}_{\Delta} - \text{Area of 3 sectors} = A_{\text{enclosed}}$$

$$\frac{1}{2}(6\sqrt{3})(12) - 3\left[\frac{60}{360}(\pi 6^2)\right]$$

$$36\sqrt{3} - 3\left[\frac{1}{6}\cdot 36\pi\right]$$

$$\boxed{36\sqrt{3} - 18\pi} = A_{\text{enclosed}}$$

(29)



$$A_{\text{trap }ABYX} - A_{\substack{\text{large}\\ \text{sector}}} - A_{\substack{\text{small}\\ \text{sector}}} = A_{\text{shaded}}$$

$$\frac{1}{2}(4\sqrt{3})(6+2) - \frac{1}{6}(\pi 6^2) - \frac{120}{360}(\pi 2^2) =$$

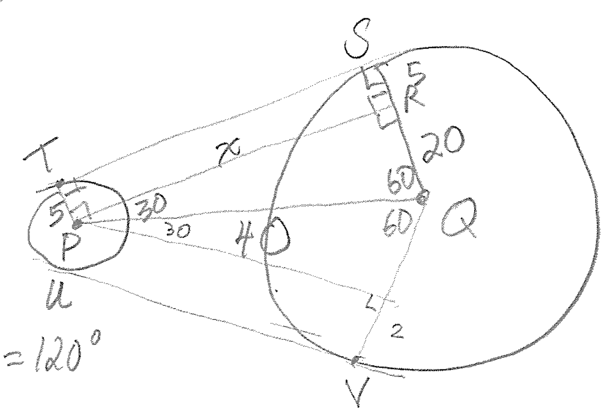
$$16\sqrt{3} - 6\pi - \frac{4}{3}\pi =$$

$$\boxed{16\sqrt{3} - \frac{22}{3}\pi} = A_{\text{shaded}}$$

or

$$\boxed{\frac{48\sqrt{3} - 22\pi}{3}}$$

(30)



$m\widehat{TPU} = 120^\circ$

$TS = x$

$40^2 = 20^2 + x^2$

$x^2 = \sqrt{1200}$

$x = 20\sqrt{3}$

$TS = 20\sqrt{3}$

$$\text{belt} = 2(TS) + \widehat{TU} + \widehat{SV}$$

$$= 2(20\sqrt{3}) + \frac{120}{360}(2\pi 5) + \frac{240}{360}(2\pi 20)$$

$$= 40\sqrt{3} + \frac{10\pi}{3} + \frac{2}{3}(40\pi)$$

$$= \boxed{40\sqrt{3} + \frac{110\pi}{3}}$$

or

$$\boxed{\frac{120\sqrt{3} + 110\pi}{3}}$$