HOMEWORK Q&A

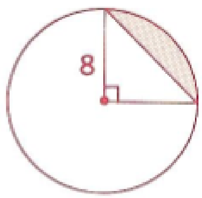
Note Title 4/27/2016

11.6

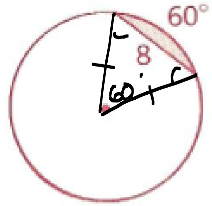
10 If the area of a circle is 60π and the area of a sector of the circle is 24π, what is the measure of the sector's arc?

11 Find the area of each segment.

a



b



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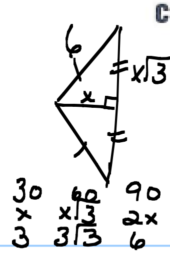
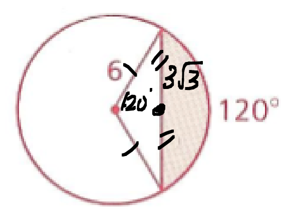




10. $A_{SECTOR} = \frac{ARC}{WHOLE}(A_{\odot})$

$\cancel{24\pi} = \frac{ARC}{\cancel{360}_{6}} \cancel{60\pi}^{1}$

$6(24) = ARC$

$120 + 24$

$144° = ARC$

11a SEG = SECTOR − Δ

$\frac{90}{360} 8^2\pi - \frac{1}{2} 8 \cdot 8$

$\frac{1}{4} 64\pi$

$16\pi - 32$

11b. sector − eq Δ

$\frac{60}{360} 8^2\pi - \frac{8^2\sqrt{3}}{4}$

$\frac{64}{6}\pi$

$\frac{32}{3}\pi - 16\sqrt{3}$

11c sector − Δ

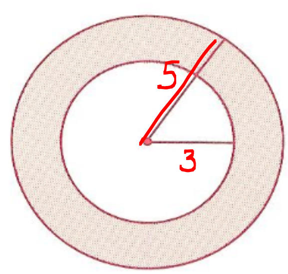
$\frac{120}{360} 6^2\pi - \frac{1}{2} 6\sqrt{3} \cdot 3$

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

$12\pi - 9\sqrt{3}$

12 **a** Find the area of the shaded figure if the inner radius is 3 and the outer radius is 5. (Such a figure is called an ***annulus***.)

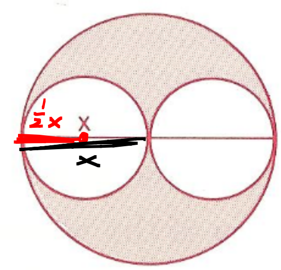
b If the inner circle has a radius r and the outer circle has a radius R, derive the formula for the area of any annulus.



$R_o^2\pi - r_i^2\pi = 5^2\pi - 3^2\pi = 25\pi - 9\pi = 16\pi$

13 **a** What is the area of the shaded region if x = 6? If x = 10? If x = 7?

b What observation can you make about the shaded region's area?




$- \infty$

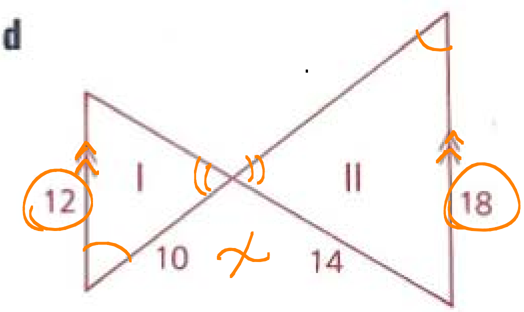
$$x^2\pi - 2\left(\tfrac{1}{2}x\right)^2\pi = \tfrac{1}{2}x^2\pi$$

x			
6	$36\pi - 18\pi$	$=$	18π
7	$49\pi - \frac{49}{2}\pi$	$=$	$\frac{49}{2}\pi$
10	$100\pi - 50\pi$	$=$	50π

$\boxed{11.7}$

9

d

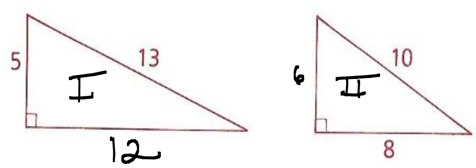


~△s by AA~

$\frac{12}{18} = \frac{6\cdot 2}{6\cdot 3} = \left(\frac{2}{3}\right)$ sides

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

11 Find the ratio of the areas of the two triangles.



$$\frac{\text{I}}{\text{II}} = \frac{\cancel{\tfrac{1}{2}}\cdot \cancel{12}^{1}\cdot 5}{\cancel{\tfrac{1}{2}}\cdot \cancel{8}_{4}\cdot \cancel{6}_{1}} = \frac{5}{4}$$

13 The ratio of corresponding medians of two similar triangles is 5:2. Find the area of the larger triangle if the smaller triangle has an area of 40.

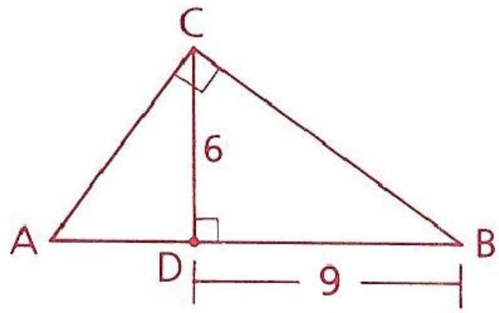
$$\left(\frac{5}{2}\right)^2 = \frac{25x}{4x} = \frac{250}{40}$$

17 Find $A_{\triangle ACD} : A_{\triangle BCD}$.

$\frac{1}{2} AD(CD) : \frac{1}{2} DB(CD)$

$$\frac{\cancel{\frac{1}{2}}\, 4 \cdot \cancel{6}}{\cancel{\frac{1}{2}}\, 9 \cdot \cancel{6}}$$

$\boxed{4:9}$



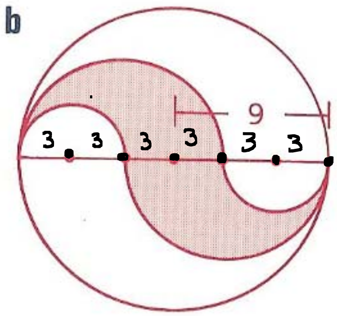
alt-hyp thm

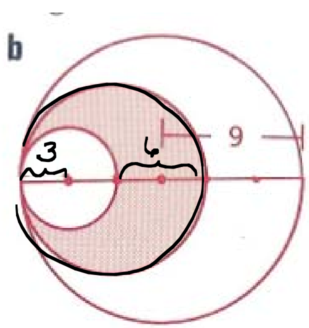
$6^2 = AD(9)$

$4 = AD$

AFTER SM. GRP. REVIEW

FIND AREA OF SHADED REGION

20 



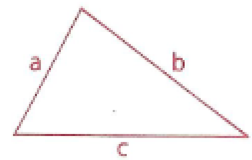
$6^2\pi - 3^2\pi$

$36\pi - 9\pi = 27\pi$

11.8

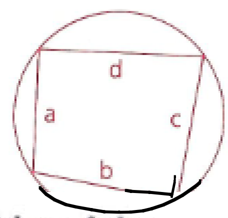
A useful formula for finding the area of a triangle was developed nearly 2000 years ago by the mathematician Hero of Alexandria.

Theorem 111 $A_{\Delta} = \sqrt{s(s-a)(s-b)(s-c)}$, *where a, b, and c are the lengths of the sides of the triangle and* s = *semiperimeter* = $\frac{a+b+c}{2}$. (*Hero's formula*)



In about A.D. 628, a Hindu mathematician, Brahmagupta, recorded a formula for the area of an inscribed quadrilateral. This formula applies only to quadrilaterals that can be inscribed in circles (known as ***cyclic quadrilaterals***).

Theorem 112 $A_{\text{cyclic quad}} = \sqrt{(s-a)(s-b)(s-c)(s-d)}$, *where a, b, c, and d are the sides of the quadrilateral and* s = *semiperimeter* = $\frac{a+b+c+d}{2}$. (*Brahmagupta's formula*)



1 Use Hero's formula to find the areas of triangles with sides of the following lengths.

- **a** 3, 4, and 5 = $A = 6$
- **b** 3, 3, and 4
- **c** 5, 6, and 9
- **d** 3, 7 and 8
- ~~**e** 8, 15, and 17~~
- **f** 13, 14, and 15

2 Use Hero's formula to find the area of an equilateral triangle with a side 8 units long.

3 Use Brahmagupta's formula to find the areas of inscribed quadrilaterals with sides of the following lengths.

- **a** 5, 7, 4, and 10
- **b** 2, 4, 5, and 9
- **c** 3, 5, 9, and 5
- **d** 1, 5, 9, and 11

1a $s = \frac{12}{2} = 6$ $\quad A = \sqrt{6(3)(2)(1)}$

$\sqrt{(3\cdot 2)\cdot(3\cdot 2)\cdot 1}$

6

3, 7, 8 $\quad p = 18 \therefore s = 9$ $\quad A = \sqrt{9(6)(2)(1)}$

$\sqrt{(3\cdot 3)\,3\,(2\cdot 2)}$

$3\cdot 2\sqrt{3}$

$6\sqrt{3}$