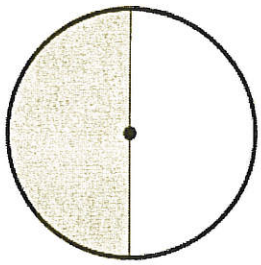
Sec. 12.4 – Area and Sector Area of a circle

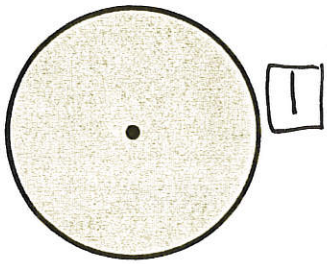
Name Key Hr____

What fraction of each circle is shaded?

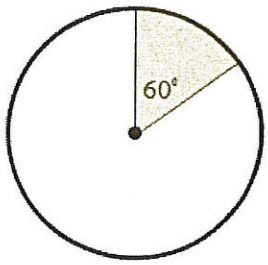
1. $\frac{1}{2}$



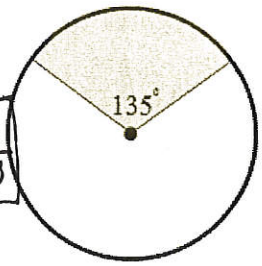
2. 1



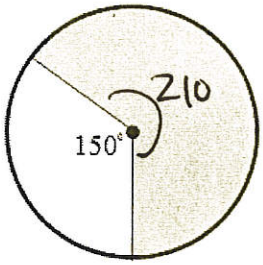
3. $\frac{60}{360} = \frac{1}{6}$



4. $\frac{135}{360} = \frac{3}{8}$

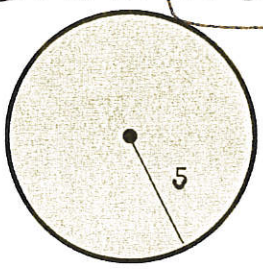


5. $\frac{210}{360} = \frac{7}{12}$

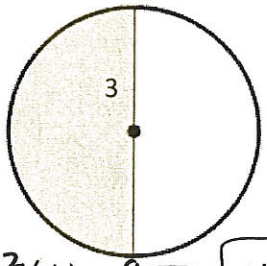


Find the area of each shaded sector. $A = \pi r^2\left(\frac{\theta}{360}\right)$

6. $25\pi = 78.5 \text{ units}^2$

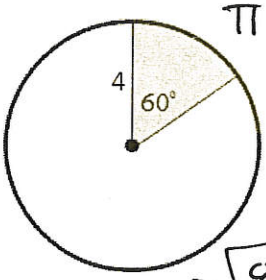


7.



$\pi 3^2\left(\frac{1}{2}\right) = \frac{9\pi}{2} = 14.1 \text{ units}^2$

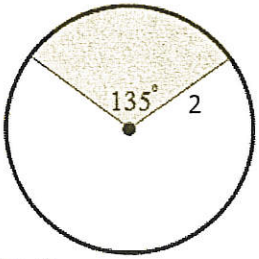
8. $\pi 4^2\left(\frac{1}{6}\right)$



$\frac{16\pi}{6} = \frac{8\pi}{3}$

$= 8.4 \text{ units}^2$

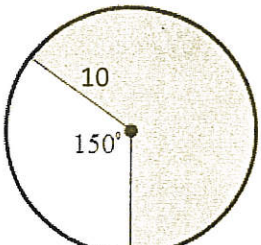
9.



$\pi 2^2\left(\frac{3}{8}\right) = \frac{12\pi}{8} = \frac{3\pi}{2}$

$= 4.7 \text{ units}^2$

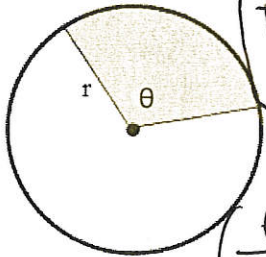
10.



$\pi 10^2\left(\frac{7}{12}\right) = \frac{700\pi}{12}$

$= 183.3 \text{ units}^2$

11.



$\pi r^2\left(\frac{\theta}{360}\right)$

or

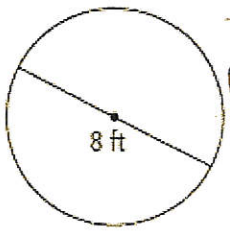
$\left(\frac{\theta}{360}\right)\pi r^2$

12. What is a general formula to find an area of a sector?

$\left(\frac{\theta}{360}\right)r^2\pi$ or $\left(\frac{\theta}{360}\right)\pi r^2$ or $\pi r^2\left(\frac{\theta}{360}\right)$

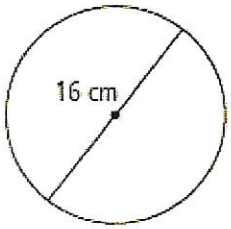
Practice Section 12.2 Area of Circles and Shaded Regions

Find the area of the circle.

13. 

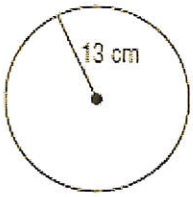
$\pi(4)^2$

$16\pi \simeq 50.3 ft^2$

14. 

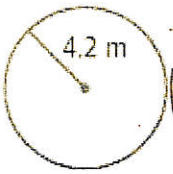
$\pi(8)^2$

$64\pi \simeq 201.1\ cm^2$

15. 

$\pi(13)^2$

$169\pi \simeq 530.9\ cm^2$

16. 

$\pi(4.2)^2$

$17.64\pi \simeq 55.4 m^2$

Given the area find the radius. $A = \pi r^2$

17. $A = 8\ cm^2$ $\frac{\pi r^2}{\pi} = \frac{8}{\pi}$

$\sqrt{r^2} = \sqrt{\frac{8}{\pi}} \simeq 1.6 cm$

18. $A = 125\ cm^2$ $\frac{125}{\pi} = \frac{\pi r^2}{\pi}$ $\sqrt{\frac{125}{\pi}} = \sqrt{r^2}$

$r \simeq 6.3 cm$

Given the area find the circumference. $C = 2\pi r$

19. $A = 50\ cm^2$ $50 = \pi r^2$

$r \simeq \sqrt{\frac{50}{\pi}}$

$25.1\ cm$

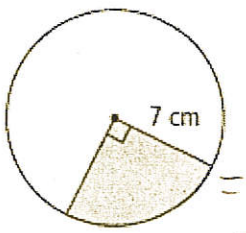
$C = 2\pi\sqrt{\frac{50}{\pi}}$

20. $A = 75\ cm^2$ $\frac{75}{\pi} = \frac{\pi r^2}{\pi}$ $r \simeq 4.9$

$\sqrt{\frac{75}{\pi}} = \sqrt{r^2}$

$C = 2\pi\sqrt{\frac{75}{\pi}} \simeq 30.7\ cm$

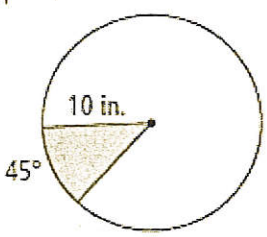
Find the Area of the shaded region.

21. 

$\pi 7^2\left(\frac{90}{360}\right)$

$= 49\pi\left(\frac{1}{4}\right)$

$\simeq 38.5 cm^2$

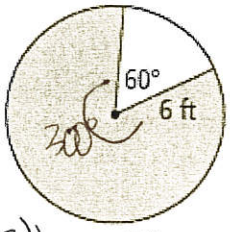
22. 

$A = \pi 10^2\left(\frac{45}{360}\right)$

$= 100\pi\left(\frac{1}{8}\right)$

$\simeq 39.3 in^2$

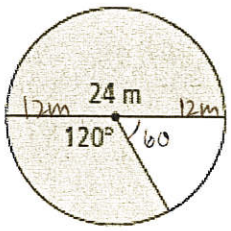
23.



$\frac{300}{360}(\pi 6^2) = \frac{5}{6}(36\pi)$

$\approx 94.2 ft^2$

24.

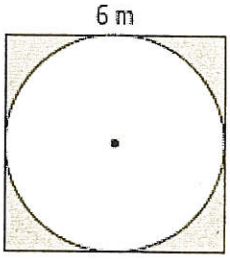


$\frac{300}{360}(\pi 12^2)$

$= \frac{5}{6}(144\pi)$

$\approx 377 m^2$

25.



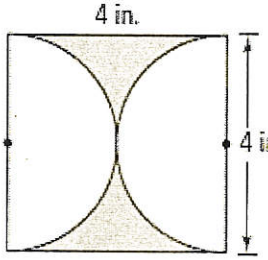
square - circle

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

$36 - 9\pi$

$\approx 7.7 m^2$

26.



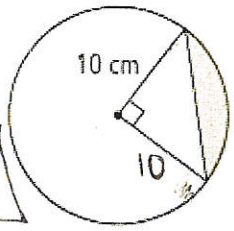
square - circle

$4 \cdot 4 - \pi 2^2$

$= 16 - 4\pi$

$\approx 3.4 in^2$

27.



$25\pi - 50$

$\approx 28.53 cm^2$

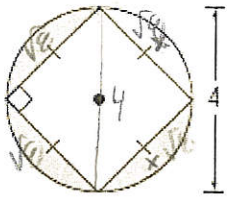
Athange $= \frac{1}{2}(10)(10) =$

$\frac{1}{2}(100) = 50 cm^2$

Sector $\pi 10^2(\frac{90}{360})$

$\frac{100\pi}{4} = 25\pi$

28.



Circle - square

$\pi 2^2$

$= 4\pi - 8$

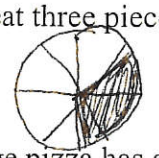
$4\pi - 8 = 4.57$

$4.57(\frac{3}{4}) = 3.43$ units²

$x^2 + x^2 = 4^2$

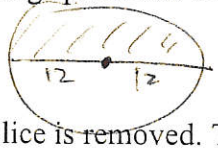
A pizza has a radius of 10in. Use this information to answer questions 29 -31.

29. You eat three pieces of a pizza divided into eight slices. What is the area of the pizza you ate?



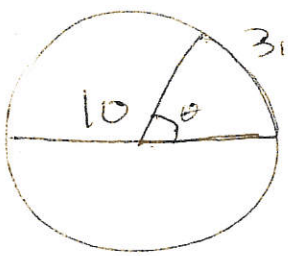
$\frac{3}{8}\pi 10^2$ $\approx 117.8 in^2$

30. A large pizza has a radius of 12in. What is the area of half of the large pizza?



$A = \pi 12^2(\frac{1}{2}) = \frac{144\pi}{2} = 72\pi$ $\approx 226.2 in^2$

31. A slice is removed. The length of the crust of the missing slice is 3in. What is the area of the missing slice?



$C = \pi 20$

$= 62.83$

$- 3$

59.83

% of circumference that is 3 inches...

$\frac{3}{62.83} = .047746 = 4.77\%$

$100\pi(.047746) = 15 in^2$

Area (4.77%) =