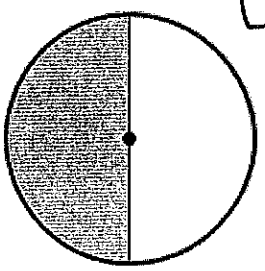
12.3 – Circumference and Arc Length

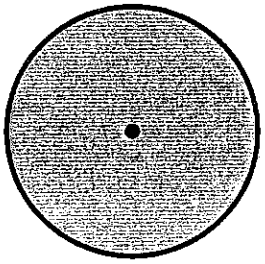
Name Key Hr_____

What fraction of each circle is shaded?

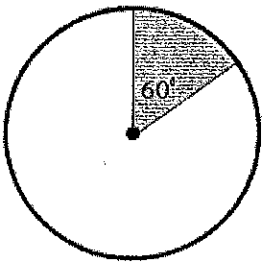
1. $\frac{1}{2}$



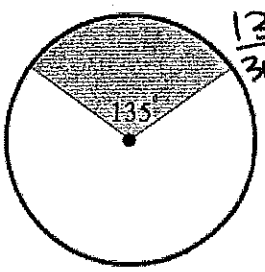
2. 1



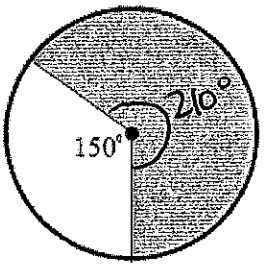
3. $\frac{60}{360} = \frac{1}{6}$



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

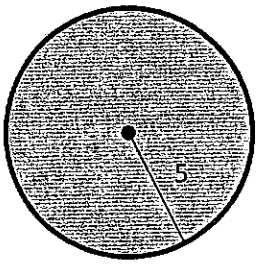


5. $\frac{210}{360} = \frac{7}{12}$

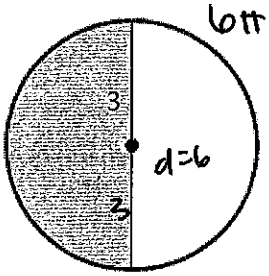


Find the length of each arc that intercepts the shaded sector. (circumference) $C = 2\pi r$ or πd

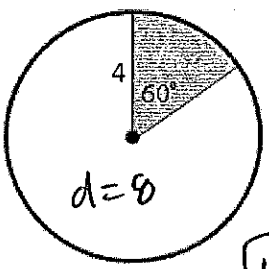
6. $2\pi 5 = 10\pi = 31.42$ units



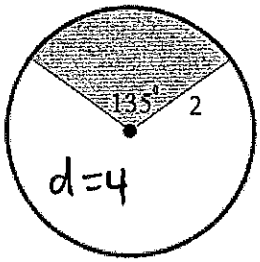
7. $6\pi\left(\frac{1}{2}\right) = 3\pi = 9.42$ units



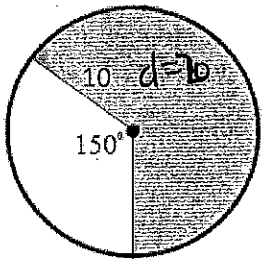
8. $8\pi\left(\frac{1}{6}\right) = \frac{4\pi}{3} =$ 4.19 units



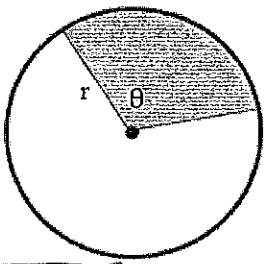
9. $4\pi\left(\frac{3}{8}\right) = \frac{3\pi}{2} =$ 4.71 units



10. $10\pi\left(\frac{7}{12}\right) = \frac{35\pi}{3} =$ 36.65 units

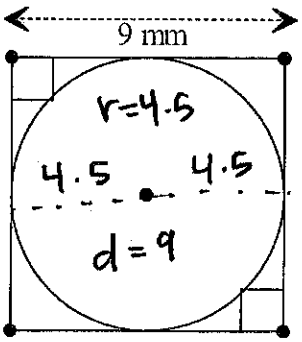


11. $2\pi r\left(\frac{\theta}{360}\right)$ or $\pi d\left(\frac{\theta}{360}\right)$



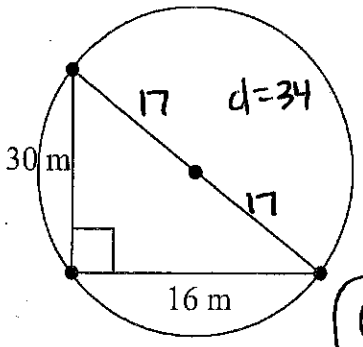
Find the EXACT (leave π in you answer) circumference of the circle. (figures not to scale)

22.



$C = 9\pi$ mm

23.



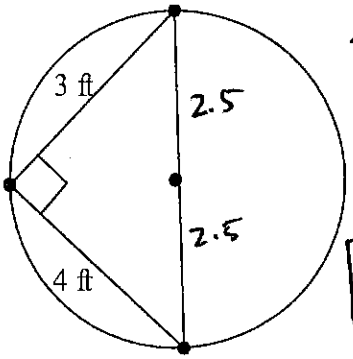
$30^2+16^2=c^2$

$1156=c^2$

$34=c$

$C = 34\pi$ m

24.



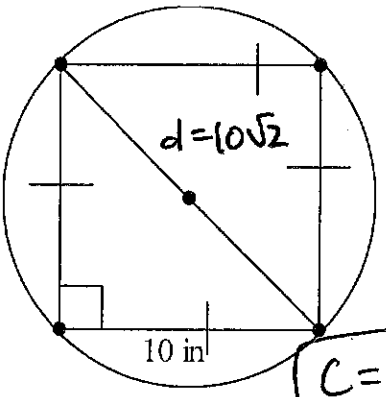
$3^2+4^2=c^2$

$25=c^2$

$5=c$

$C = 5\pi$ ft

25.



$10^2+10^2=c^2$

$200=c^2$

$\sqrt{200}=c$

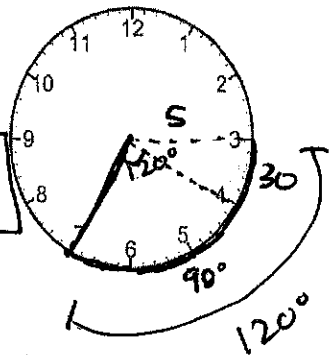
$2 \cdot 100$

$10 \cdot 10$

$10\sqrt{2}=c$

$C = 10\sqrt{2}\pi$ in

Consider a standard 12 hour clock like the one below with a radius of 5 inches. Use this to answer questions 26-27. (Always use the shortest distance)



26. What is the length of the arc between the 3 and the 7?

$\frac{360}{12} = 30°$ per #, $\frac{120°}{360} = \frac{1}{3}$ $2\pi 5\left(\frac{1}{3}\right) = \frac{10\pi}{3} =$ 10.5 in

27. It is 7:20. What is the length of the arc between the minute and hour hands?

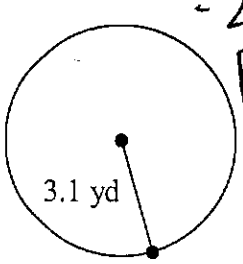
$90°$ $\frac{90}{360} = \frac{1}{4}$ $2\pi 5\left(\frac{1}{4}\right) = \frac{10\pi}{4} = \frac{5\pi}{2} =$ 7.9 in

12. What is a general formula to find the arc length of a circle?

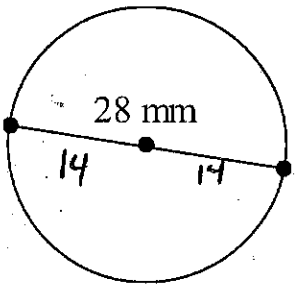
$\left(\frac{\theta}{360}\right)2\pi r$ or $\left(\frac{\theta}{360}\right)\pi d$

Find the Circumference of the following circles.

13. $C = 2\pi r$
$= 2\pi(3.1)$
$C = 19.48$ yds



14. $C = 2\pi 14$ or 28π
87.96 mm



The radius, diameter, or circumference of a circle is given. Find the missing measures. Round your answers to the nearest hundredth if necessary.

15. $r = 7\ mm, d =$ 14 mm, $C =$ $14\pi = 43.98$ mm.

16. $C = 26\pi\ mi, d =$ 26 mi, $r =$ 13 mi.

17. $d = 26.8\ cm, r =$ 13.4 cm, $C =$ $26.8\pi = 84.19$ cm.

18. $C = 76.4\ m, d =$ $\frac{76.4}{\pi} = 24.32$m, $r =$ $\frac{24.32}{2} = 12.16$m.

Given the Circumference Find the radius of a circle. $C = 2\pi r$, $r = \frac{C}{2\pi}$

19. $C = 9\ cm$ $\frac{9}{(2\pi)} = 1.43$ cm

20. $C = 15\ cm$ $\frac{15}{(2\pi)} = 2.39$cm

21. $C = 64cm$ $\frac{64}{(2\pi)} = 10.19$ cm