1. Find the circumference.   **2.** Find the circumference.   **3.** Find the radius.

8 ft $50.27\,ft$

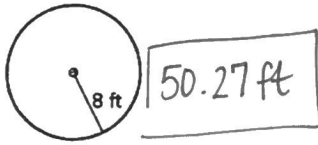13 in. $40.84\,in$

r $10.50\,cm$

C = 65.98 cm
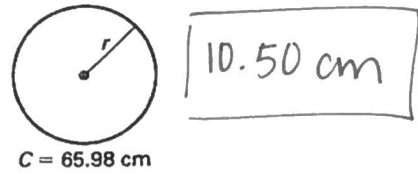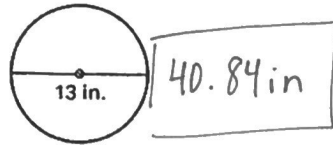
Find the indicated measure.

4. The exact radius of a circle with circumference 42 meters $\dfrac{21}{\pi}\,m.$

5. The exact diameter of a circle with circumference 39 centimeters $\dfrac{39}{\pi}\,m.$

6. The exact circumference of a circle with diameter 15 inches $15\pi\,in.$

7. The exact circumference of a circle with radius 27 feet $54\pi\,ft.$

Find the length of $\overwidearc{AB}$.
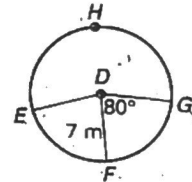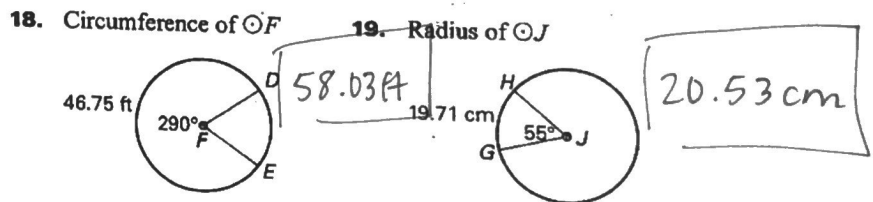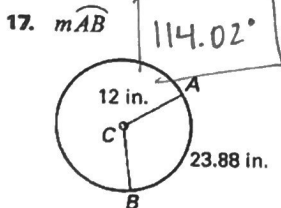
8.   6 cm   A   60°   P   B $6.28\,cm$

9.   B   150°   P   18 in.   A $47.12\,in.$

10.   A   B   30°   P   28 ft   C $7.33\,ft.$
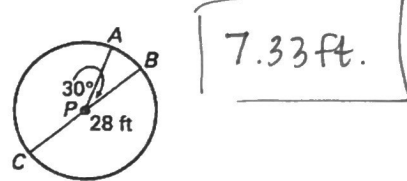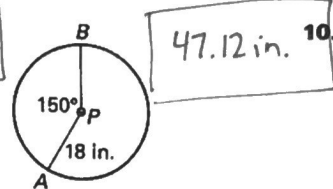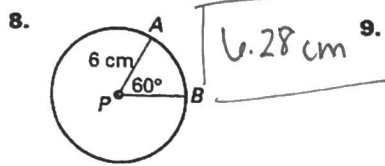
In ⊙D shown below, ∠EDF ≅ ∠FDG. Find the indicated measure.

11. $m\overwidearc{EFG}$ $160°$

12. $m\overwidearc{EHG}$ $200°$

13. Length of $\overwidearc{EFG}$ $19.55\,m.$

14. Length of $\overwidearc{EHG}$ $24.43\,m.$

15. $m\overwidearc{EHF}$ $280°$

16. Length of $\overwidearc{FEG}$ $34.21\,m$

H   D   80°   E   7 m   G   F

Find the indicated measure.

17. $m\overwidearc{AB}$ $114.02°$

12 in.   A   C   23.88 in.   B

18. Circumference of ⊙F $58.03\,ft$

46.75 ft   290°   F   D   E

19. Radius of ⊙J $20.53\,cm$

19.71 cm   H   55°   J   G

Find the perimeter of the region.

20.
5 mm

45.71 mm

21.
138.56 in

41 in.
11 in.   11 in.
41 in.
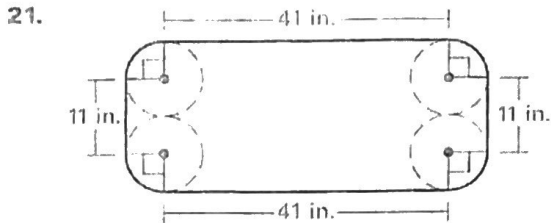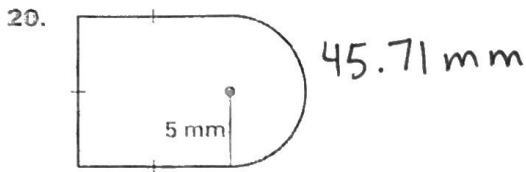
22. In the table below, $\overset{\frown}{AB}$ refers to the arc of a circle. Complete the table.

Radius	4	11	9.79	4.81	9.5	10.7
$m\overset{\frown}{AB}$	30°	43.02°	105°	75°	88.24°	270°
Length of $\overset{\frown}{AB}$	?	8.26	17.94	6.3	14.63	50.42

23. **Bicycles** The chain of a bicycle travels along the front and rear sprockets, as shown. The circumference of each sprocket is given.

10 in.

160°   185°

10 in.

rear sprocket
C = 12 in.

front sprocket
C = 20 in.
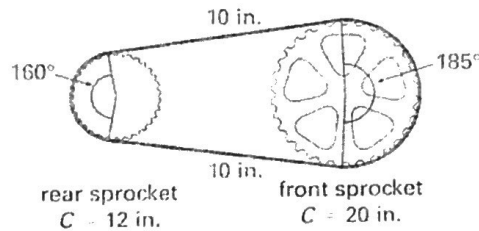
a. About how long is the chain?   **35.61 in**

b. On a chain, the teeth are spaced in $\frac{1}{2}$ inch intervals. About how many teeth are there on this chain?   **71 teeth**

24. **Enclosing a Garden** You have planted a circular garden with its center at one of the corners of your garage, as shown. You want to fence in your garden. About how much fencing do you need?

56.55 ft.

12 ft