● Sectors, Segments, and ~~Annuluses~~ Annuli
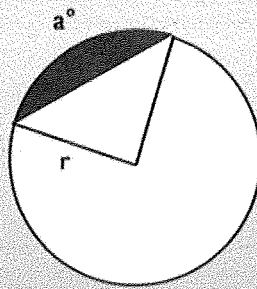
What is the area?

$a°$

r
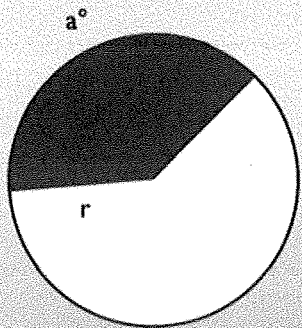
Sector
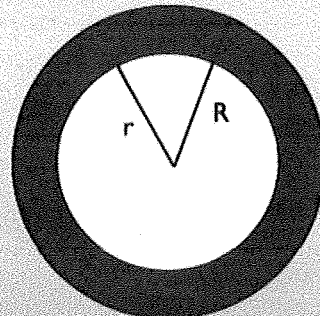a fraction of the circle

$$A = \frac{a}{360}\pi r^2$$

$a°$

r

Segment
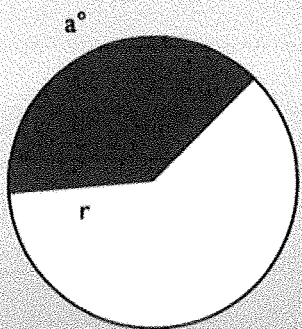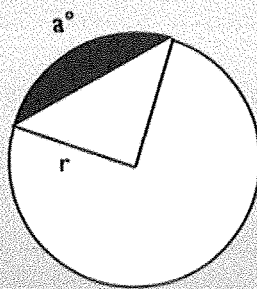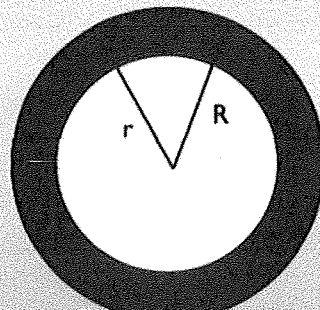the sector minus a triangle

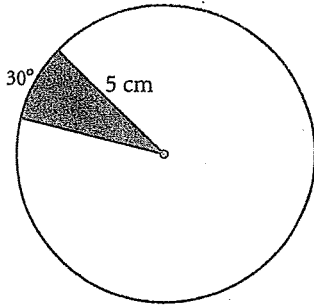$$A = \frac{a}{360}\pi r^2 - \frac{1}{2}bh$$
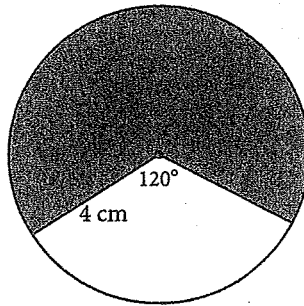
r R

Annulus
a big circle minus a small one

$$A = \pi R^2 - \pi r^2$$

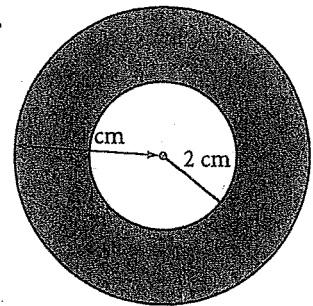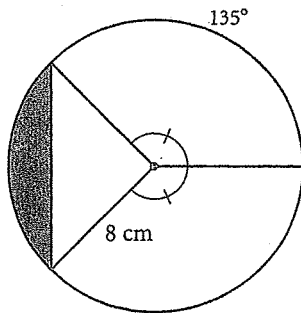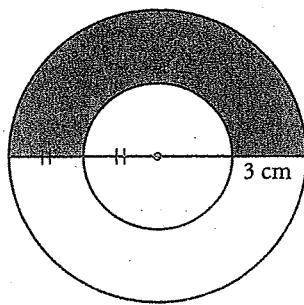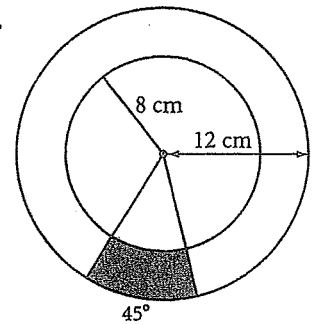In Exercises 1–6, find the area of the shaded region. Write your answers in terms of π.

1.

30° 5 cm

2.

120°
4 cm

3.

cm
2 cm

4.

135°

8 cm

5.

3 cm

6.

8 cm
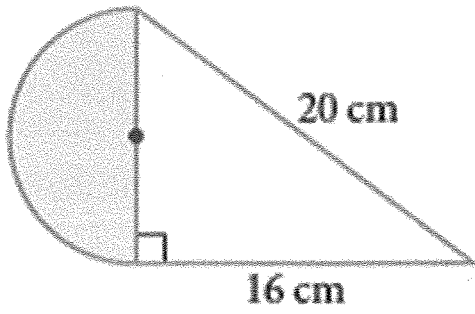12 cm

45°

7. Shaded area is 40π cm^2. Find r.

144°

r

8. Shaded area is 54π cm^2. Find x.

12 cm
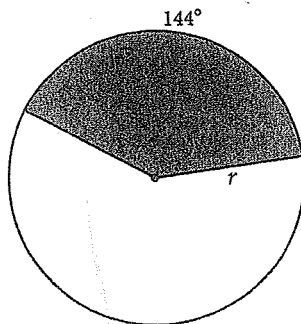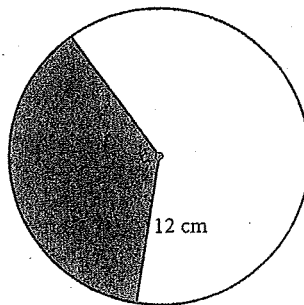
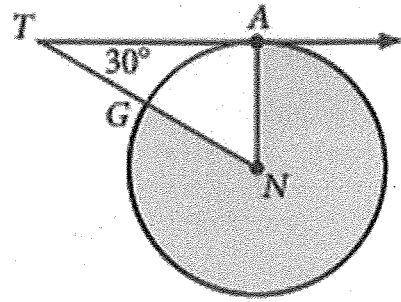9. Shaded area is 51π cm^2. The diameter of the larger circle is 20 cm. Find r.
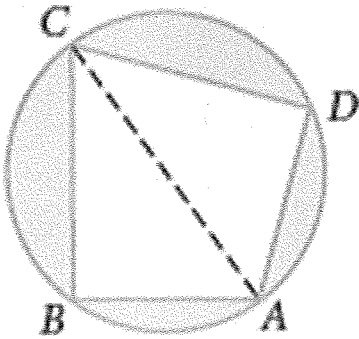
r

10)

20 cm

16 cm

11)

$TA = 12\sqrt{3}$ cm

T

A

30°

G

N
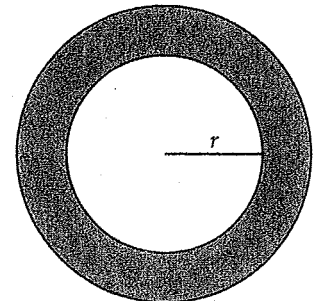
12) Kite *ABCD*, with
AB = 6 cm and
BC = 8 cm

C

D

B

A

13) Square *SQRE*,
with *SQ* = 4 m

E

S

R

Q