①

Case I: Vertex is ON the circle

$Angle = \frac{1}{2}(Arc)$

ANGLE

ARC

ARC

②

Ex. 1 Find $m\angle 1$.

A

B

1

124°

C

$$m\angle 1 =$$

③

Ex. 2 Find $m\angle 1$.

1

84°

$$m\angle 1 =$$

④

Ex. 3 Find $m\angle 1$.

108°
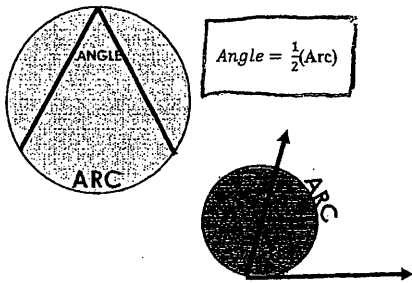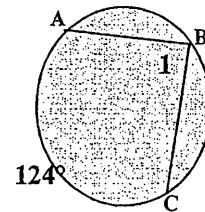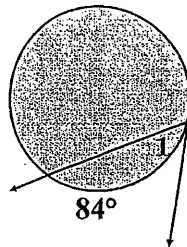
1
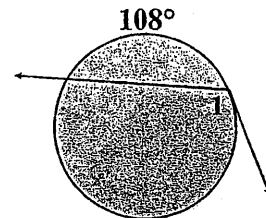
$$m\angle 1 =$$

⑤

Case II: Vertex is inside the circle

A

ARC

B

ANGLE

D

ARC

C

$Angle = \frac{1}{2}(\text{Large Arc} + \text{small Arc})$

Looks like a PLUS sign!

⑥

Ex. 4 Find $m\angle 1$.

93°

A

B

1

D

C

113°

$$m\angle 1 =$$

(7) **Ex. 5** Find $m\overset{\frown}{QT}$.

84°

92°

N Q
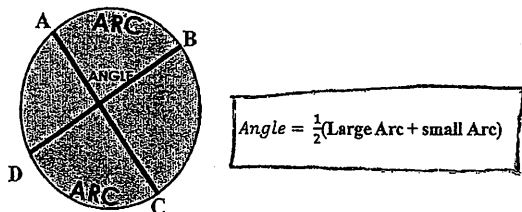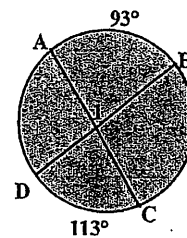
M T
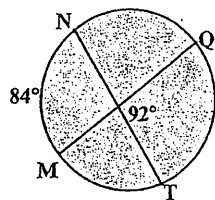
$$m\overset{\frown}{QT} =$$

(8) **Case III:** Vertex is **outside** the circle

C
ANGLE
A
small ARC
LARGE
ARC
D
B

$Angle = \frac{1}{2}(\text{Large Arc} - \text{small Arc})$

LARGE
ARC
small ARC
ANGLE

LARGE ARC
small ARC
ANGLE

(9) **Ex. 6** Find $m\angle 1$.

1

A
D

65°

B

$$m\angle 1 =$$

(10) **Ex. 7** Find $m\overset{\frown}{AB}$.

27°
A
B
70°

$$m\overset{\frown}{QT} =$$

(11) **Ex. 8** Find $m\angle 1$.
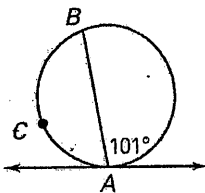
260°
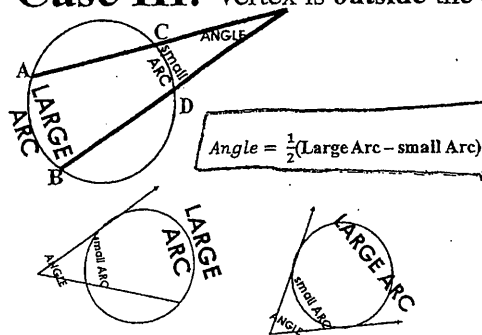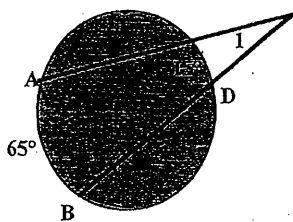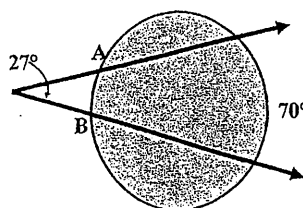
1
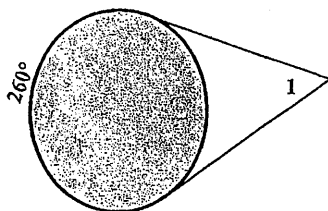
$$m\angle 1 =$$
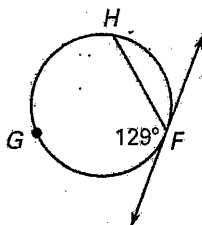
LESSON
6.5

**Exercise
Set A**

MM2G3b Understand and use properties of central, inscribed,
and related angles.

MM2G3d Justify measurements and relationships in circles
using geometric and algebraic properties.
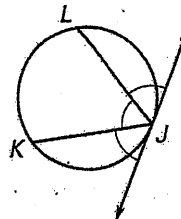
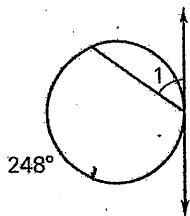**Find the indicated arc measure.**
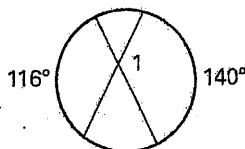
1. $m\widehat{AB}$

2. $m\widehat{FH}$

3. $m\widehat{JKL}$

Find $m\angle 1$.

4.

5.

6.
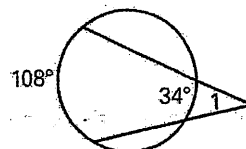
7.
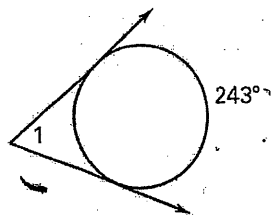
8.
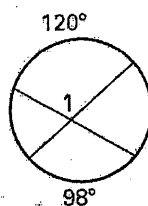
9.
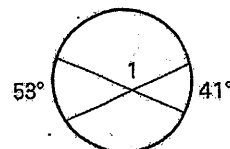
10.
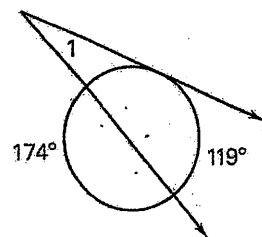
11.
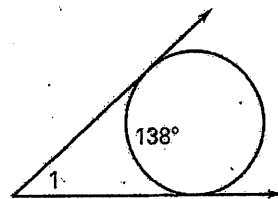
12.
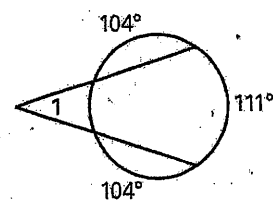
In Exercises 13–15, find the value of *x*.

13.

14.

15.

UNIT 6
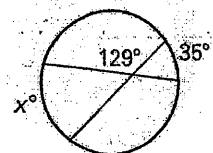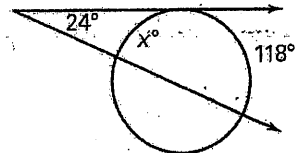
Exercise Set A (continued)

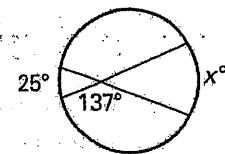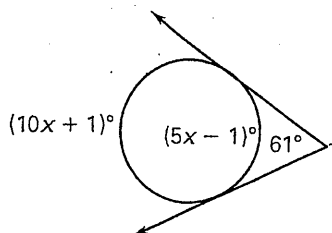**In Exercises 16–18, find the value of x.**

16.

$(10x + 1)°$ $(5x - 1)°$ $61°$

17.

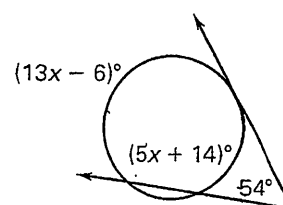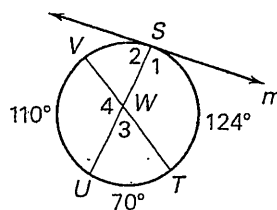$39°$ $(7x - 2)°$ $(17x + 6)°$

18.

$(13x - 6)°$ $(5x + 14)°$ $54°$
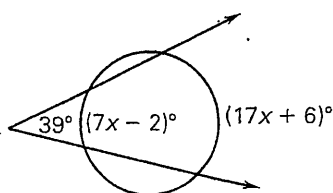
19. Angle Measures In the diagram shown, *m* is tangent to the circle at the point *S*. Find the measures of all the numbered angles.

S, V, 2, 1, 4, W, m, 110°, 124°, 3, U, 70°, T

Use the diagram shown to find the measure of the angle.

20. $m\angle CAF$

21. $m\angle AFB$

22. $m\angle CEF$

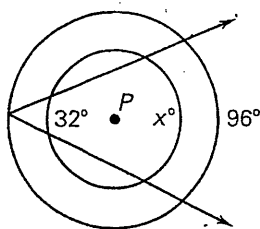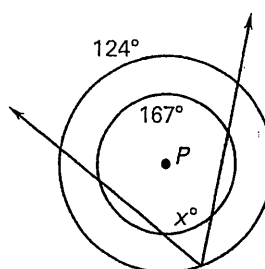**23.** $m\angle CFB$

24. $m\angle DCF$

25. $m\angle BCD$

C, 120°, B, D, A, F, E
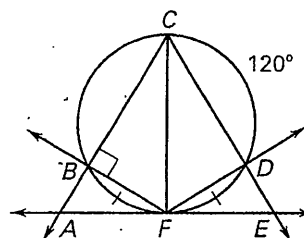
In Exercises 26 and 27, the circles have center P. Find the value of x.

26.
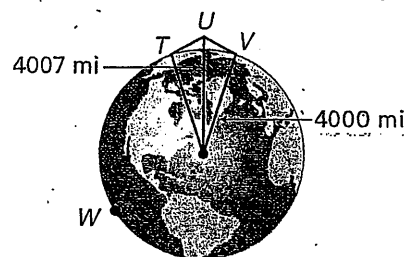
$32°$ P $x°$ $96°$

27.

$124°$ $167°$ P $x°$

28. Transportation A plane is flying at an altitude of about 7 miles above Earth as shown in the diagram. What is the measure of arc *TV* that represents the part of Earth you can see? The radius of Earth is about 4000 miles.

U, T, V, 4007 mi, 4000 mi, W

Not drawn to scale

29. Mountain Climbing A mountain climber is standing on top of a mountain that is about 4.75 miles above sea level. Use the information from Exercise 28 to find the measure of the arc that represents the part of Earth the mountain climber can see.