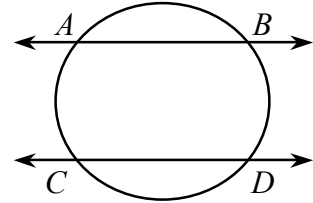


PARALLEL LINES THROUGH A CIRCLE

PARALLEL LINES AND CONGRUENT ARCS

If two parallel lines intersect a circle, congruent arcs are subtended.

\overline{AB} is parallel to \overline{CD} if and only if $\widehat{AC} \cong \widehat{BD}$

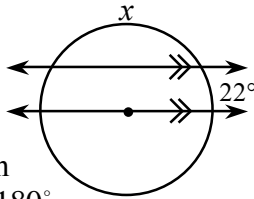


Examples

Solve for x .

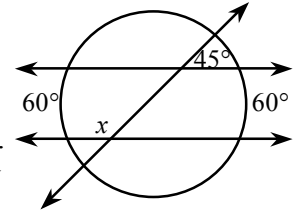
Example 1

Since parallel lines exist, the other small arc is 22° . The lower line passes through the center so $22^\circ + x + 22^\circ = 180^\circ$. Solving yields $x = 136^\circ$.



Example 2

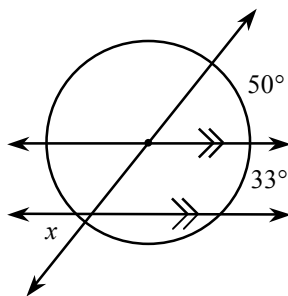
Two equal arcs indicate that the lines are parallel. Two parallel lines cut by a transversal means that $\angle x$ and the angle measuring 45° are supplementary. So $x = 135^\circ$.



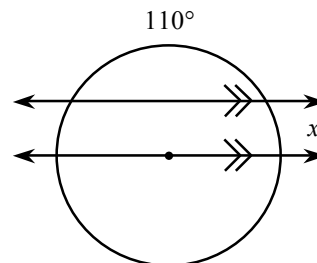
Problems

Solve for the missing variable(s). Assume that lines that appear to go through the center of the circle actually do.

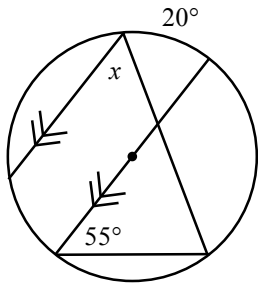
1.



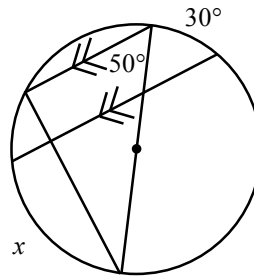
2.



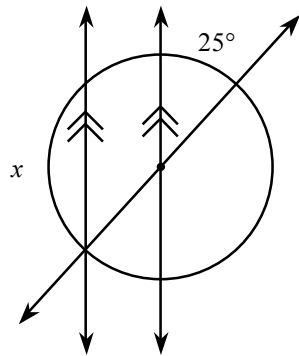
3.



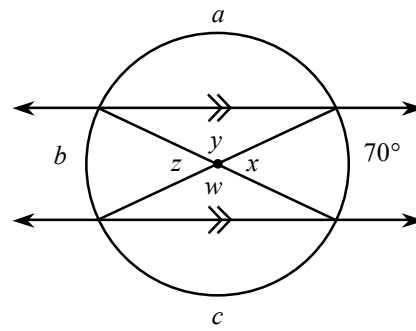
4.



5.



6.



Answers

1. 17°

2. 35°

3. 45°

4. 70°

5. 130°

6. $a = c = w = y = 110^\circ$

$b = x = z = 70^\circ$