

Geometry CP
Angles in a Circle Worksheet

Name _____

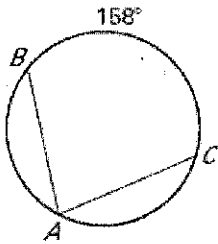
Answer Key

Find the measures of the arcs or angles as indicated. Circle the types of angles you see in each diagram. Use these to determine which rules to use. The center is emphasized in each circle with a bold point. Some of these are combination problems so you might have to circle more than one!

1. $m\angle A$

Where is the vertex located?

Center Circle Inside Outside T-T



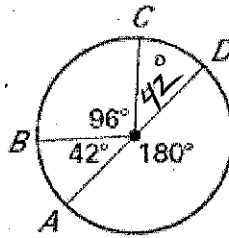
$$\frac{158}{2}$$

$m\angle A = 79^\circ$

2. \widehat{AB} and \widehat{CD}

Where is the vertex located?

Center Circle Inside Outside T-T

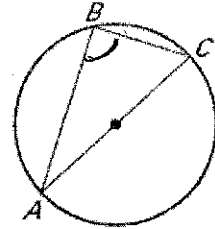


$m\widehat{AB} = 42^\circ$ AND $m\widehat{CD} = 42^\circ$

3. $m\angle B$

Where is the vertex located?

Center Circle Inside Outside T-T

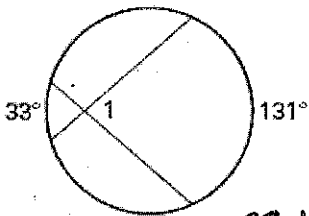


$m\angle B = 90^\circ$

4. $m\angle 1$

Where is the vertex located?

Center Circle Inside Outside T-T



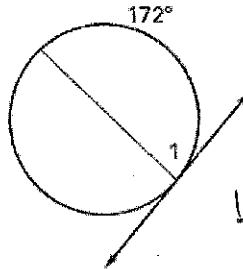
$$\frac{33 + 131}{2}$$

$m\angle 1 = 82^\circ$

5. $m\angle 1$

Where is the vertex located?

Center Circle Inside Outside T-T



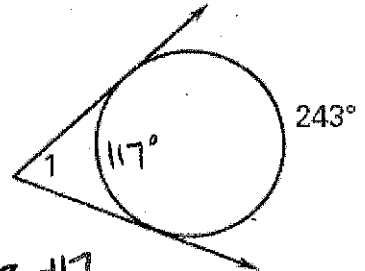
$$\frac{172}{2}$$

$m\angle 1 = 86^\circ$

6. $m\angle 1$

Where is the vertex located?

Center Circle Inside Outside T-T



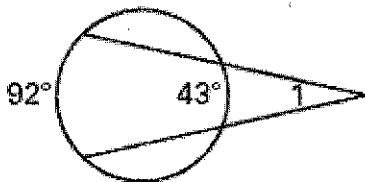
$$\frac{243 - 117}{2}$$

$m\angle 1 = 63^\circ$

7. $m\angle 1$

Where is the vertex located?

Center Circle Inside Outside T-T



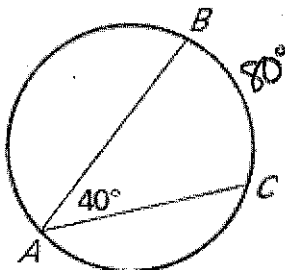
$$\frac{92 - 43}{2}$$

$m\angle 1 = 24.5$

8. $m\widehat{BC}$

Where is the vertex located?

Center Circle Inside Outside T-T



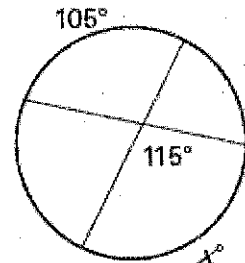
$2(40)$

$m\widehat{BC} = 80^\circ$

9. x

Where is the vertex located?

Center Circle Inside Outside T-T



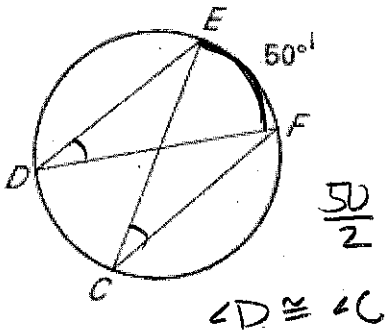
$$\frac{105 + x}{2} = 115$$

$x = 125^\circ$

$m\angle D$ and $m\angle C$

Where is the vertex located?

Center Circle Inside Outside T-T

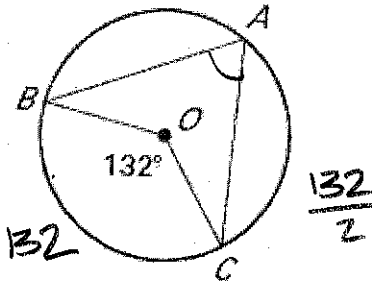


$m\angle D = 25^\circ$ AND $m\angle C = 25^\circ$

11. $m\angle A$

Where is the vertex located?

Center Circle Inside Outside T-T

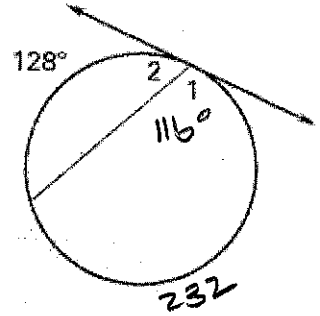


$m\angle A = 66^\circ$

12. $m\angle 1$ and $m\angle 2$

Where is the vertex located?

Center Circle Inside Outside T-T

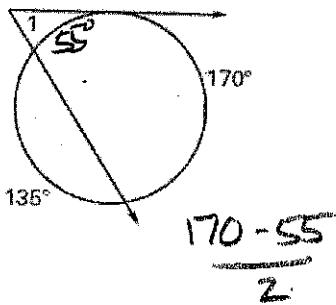


$m\angle 1 = 58^\circ$ AND $m\angle 2 = 58^\circ$

13. $m\angle 1$

Where is the vertex located?

Center Circle Inside Outside T-T

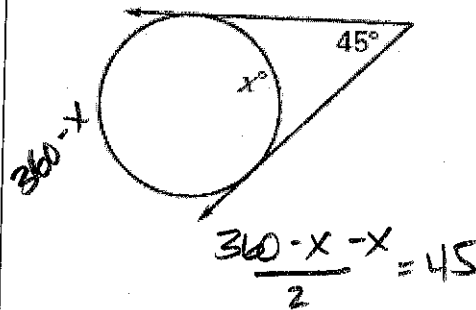


$m\angle 1 = 57.5^\circ$

14. x

Where is the vertex located?

Center Circle Inside Outside T-T

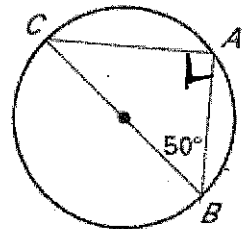


$x = 135^\circ$

15. $m\angle C$

Where is the vertex located?

Center Circle Inside Outside T-T

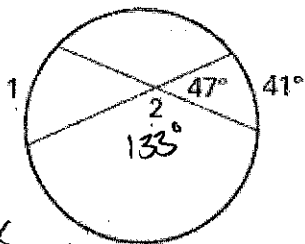


$m\angle C = 40^\circ$

16. $m\text{ARC1}$ and $m\angle 2$

Where is the vertex located?

Center Circle Inside Outside T-T



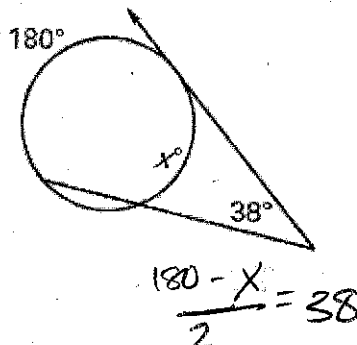
$\frac{41+x}{2} = 47$

$m\text{ARC1} = 53^\circ$ AND $m\angle 2 = 133^\circ$

17. x

Where is the vertex located?

Center Circle Inside Outside T-T



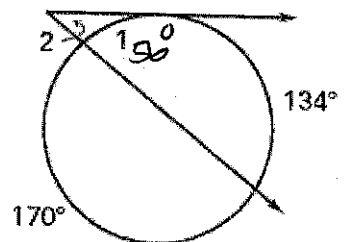
$\frac{180-x}{2} = 38$

$x = 104^\circ$

18. $m\text{ARC1}$ and $m\angle 2$

Where is the vertex located?

Center Circle Inside Outside T-T



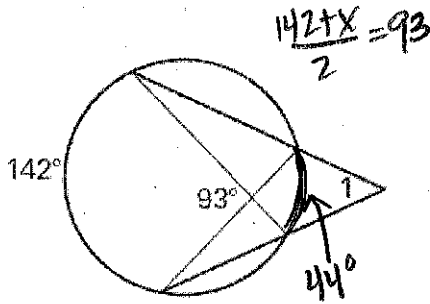
$\frac{134-56}{2}$

$m\text{ARC1} = 56^\circ$ AND $m\angle 2 = 39^\circ$

$m\angle$

Where is the vertex located?

Center Circle Inside Outside T-T



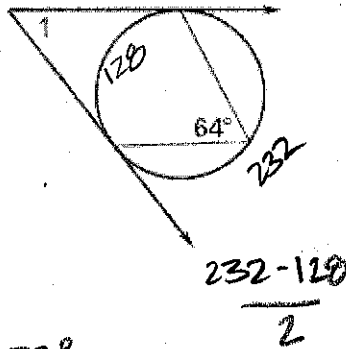
$m\angle = 49^\circ$

$\frac{142 - 44}{2}$

20. $m\angle$

Where is the vertex located?

Center Circle Inside Outside T-T



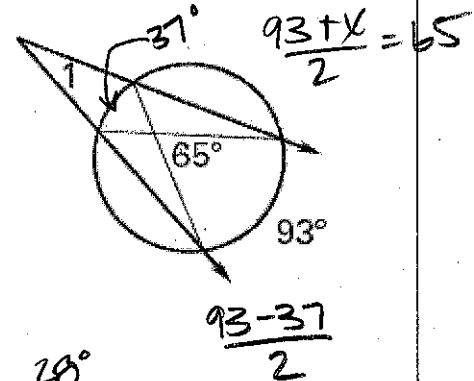
$m\angle = 52^\circ$

$\frac{232 - 128}{2}$

21. $m\angle$

Where is the vertex located?

Center Circle Inside Outside T-T



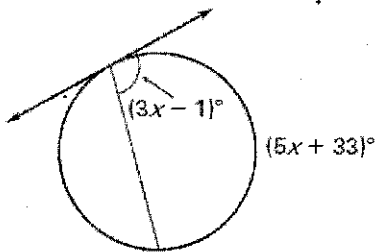
$m\angle = 28^\circ$

$\frac{93 - 37}{2}$

22. x

Where is the vertex located?

Center Circle Inside Outside T-T



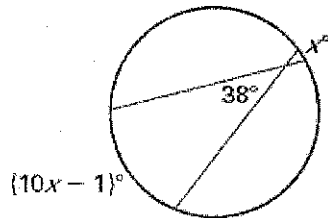
$2(3x - 1) = 5x + 33$
 $6x - 2 = 5x + 33$
 $x = 35$

$x = 35$

23. x

Where is the vertex located?

Center Circle Inside Outside T-T



$\frac{10x - 1 + x}{2} = 38$

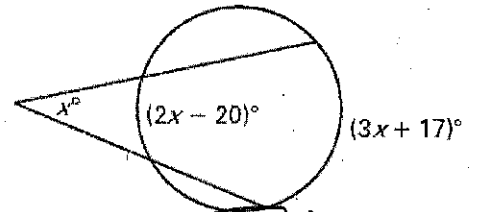
$11x - 1 = 76$
 $11x = 77$

$x = 7$

24. x

Where is the vertex located?

Center Circle Inside Outside T-T



$\frac{3x + 17 - (2x - 20)}{2} = x$

$3x + 17 - 2x + 20 = 2x$
 $x + 37 = 2x$
 $37 = x$

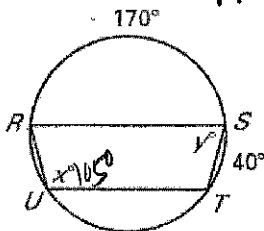
$x = 37$

Find the value of each variable using a combination of rules.

25. x and y

VERTEX ON Circle AND QUADRILATERAL INSCRIBED IN A CIRCLE

The OPPOSITE ANGLES are Supplementary

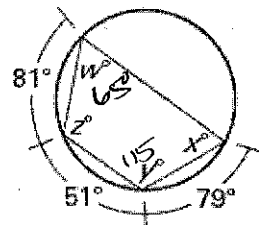


$x = 105^\circ$ AND $y = 75^\circ$

26. $x, y, w,$ and z

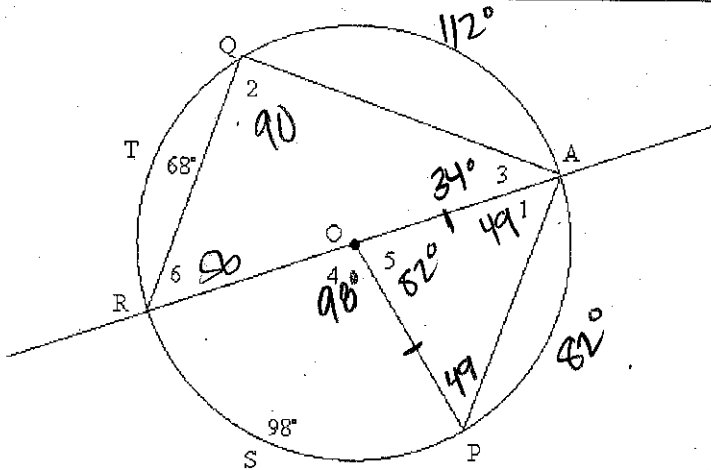
VERTEX ON Circle AND QUADRILATERAL INSCRIBED IN A CIRCLE

The OPPOSITE ANGLES are Supplementary



$x = 66^\circ$ $y = 115^\circ$ $w = 65^\circ$ $z = 114^\circ$

YOU ARE READY FOR COMBO PROBLEMS! Use Circle O to find the following angles.



27. $m\angle 1 = 49$

Where is the vertex located?

Center Circle Inside Outside T-T

28. $m\angle 2 = 90$

Where is the vertex located?

Center Circle Inside Outside T-T

29. $m\angle 3 = 34$

Where is the vertex located?

Center Circle Inside Outside T-T

30. $m\angle 4 = 98$

Where is the vertex located?

Center Circle Inside Outside T-T

31. $m\angle 5 = 52$

Where is the vertex located?

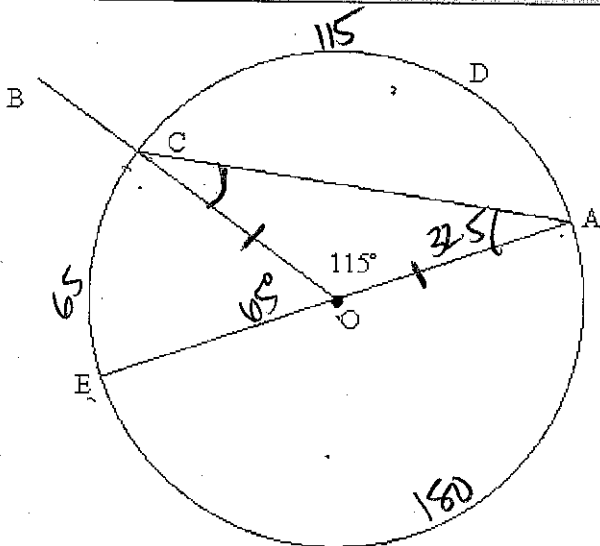
Center Circle Inside Outside T-T

32. $m\angle 6 = 50$

Where is the vertex located?

Center Circle Inside Outside T-T

Use Circle O to find the following angles AND arcs.



33. $m\angle A = 32.5$

Which rule did you use?

circle

34. $m\angle ACO = 32.5$

Which rule did you use?

circle

35. $m\angle COE = 65$

Which rule did you use?

Center

36. $m \text{ Arc } AC = 115$

Which rule did you use?

Arc = Center

37. $m \text{ Arc } CE = 65$

Which rule did you use?

Arc = Central \angle

38. $m \text{ Arc } AEC = 150$

Which rule did you use?

Arc Add. Post.

Name Answer key Date _____ Section _____

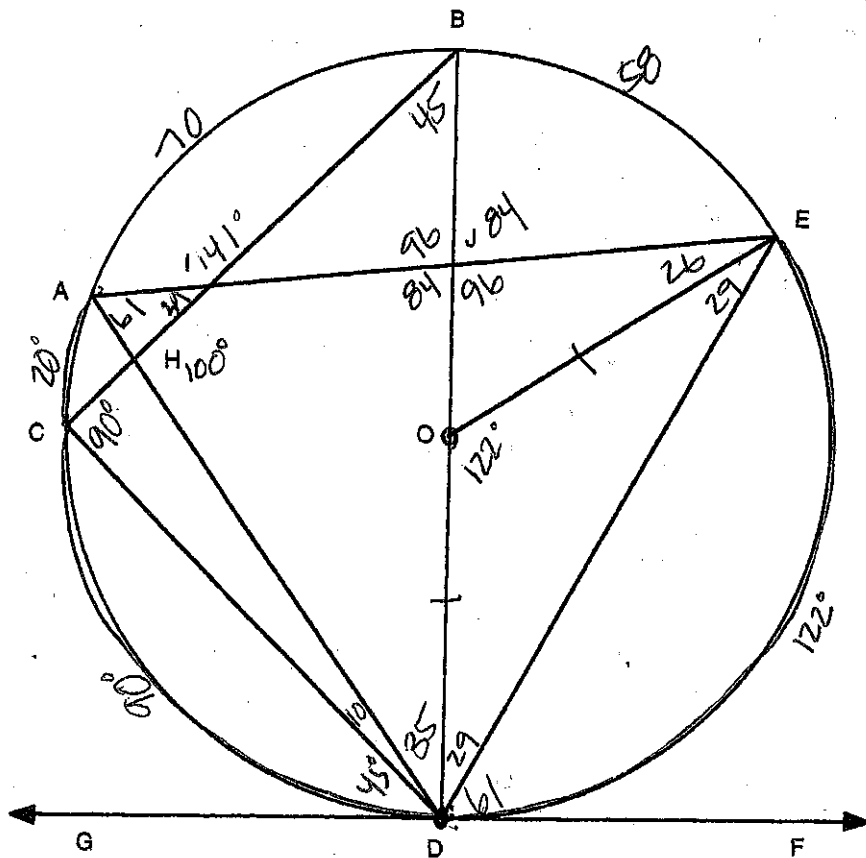
4-9B The Bigger Circle Puzzle

Using the given information and your knowledge of circles, record the measures of the angles and arcs on the circle below.

$$\frac{180 + 20}{2}$$

$$\frac{212 + 70}{2}$$

$$\frac{110 + 50}{2}$$



Name Answer Key Date _____ Section _____

4-9A The Bigger Circle Puzzle

You are given the following information:

\overleftrightarrow{GF} is tangent to Circle O at D.

$$m\widehat{DE} = 122 \quad m\widehat{AC} = 20 \quad m\widehat{DC} = 90$$

Label the circle on the accompanying worksheet with the given information, then find the measure of each angle and arc below. Write the measure of each angle and arc as you find it on the circle, and use tick marks to designate congruent angles. Check your work as you proceed. Do not make any assumptions. Record your answers below.

- | | | |
|--|--|---|
| 1. $m\angle EDF =$ <u>61°</u> | 2. $m\angle DOE =$ <u>122°</u> | 3. $m\angle OED =$ <u>29°</u> |
| 4. $m\angle ODE =$ <u>90°</u> | 5. $m\angle BDG =$ <u>90°</u> | 6. $m\angle BCD =$ <u>90°</u> |
| 7. $m\angle ADC =$ <u>10°</u> | 8. $m\angle CDG =$ <u>45°</u> | 9. $m\widehat{AB} =$ <u>70°</u> |
| 10. $m\widehat{BE} =$ <u>50°</u> | 11. $m\angle ADB =$ <u>35°</u> | 12. $m\angle DAE =$ <u>61°</u> |
| 13. $m\angle AED =$ <u>55°</u> | 14. $m\angle BOE =$ <u>50°</u> | 15. $m\angle BDF =$ <u>90°</u> |
| 16. $m\angle CDB =$ <u>45°</u> | 17. $m\angle AIB =$ <u>14°</u> | 18. $m\angle CHD =$ <u>80°</u> |
| 19. $m\angle DHB =$ <u>100°</u> | 20. $m\angle AIC =$ <u>39°</u> | 21. $m\angle BIJ =$ <u>39°</u> |
| 22. $m\angle AJB =$ <u>96°</u> | 23. $m\angle EJD =$ <u>96°</u> | 24. $m\angle AJD =$ <u>84°</u> |
| 25. $m\angle JEO =$ <u>26°</u> | | |