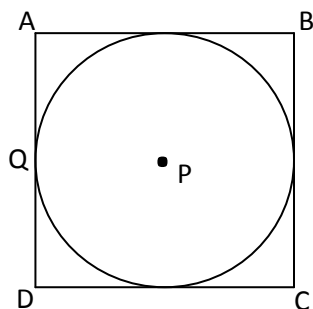


**PART I: USE THE RADIUS TO A TANGENT RELATIONSHIP AND THE 2 TANGENT TO A CIRCLE RELATIONSHIP TO COMPLETE THE FOLLOWING PROBLEMS. (REVIEW)**

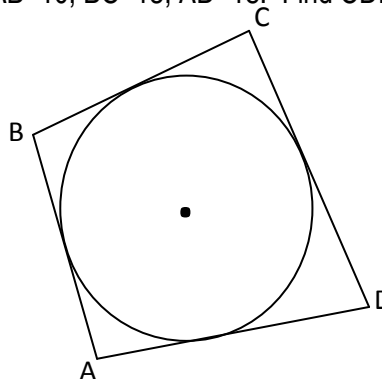
$\overline{JT}$ is tangent to circle O at T. Complete the following.	Given: $\overline{TR}$ and $\overline{TS}$ are tangents to circle O from T. $m\angle RTS = 36^\circ$
<div data-bbox="168 449 529 716" data-label="Image"> </div> <p>1. If <math>OT=6</math> and <math>JO=10</math>, then <math>JT=</math>_____.</p> <p>2. If <math>OT=6</math> and <math>JT=10</math>, then <math>JO=</math>_____.</p> <p>3. If <math>JK=9</math> and <math>KO=8</math>, then <math>JT=</math>_____.</p> <p>4. If <math>m\angle TOJ = 60^\circ</math> and <math>OT=6</math>, then <math>JO=</math>_____.</p>	<div data-bbox="846 422 1390 730" data-label="Image"> </div> <p>5. Draw <math>\overline{RS}</math> and find <math>m\angle TSR</math> and <math>m\angle TRS</math>.</p> <p>6. Draw radii <math>\overline{OS}</math> and <math>\overline{OR}</math> and find <math>m\angle ORS</math> and <math>m\angle OSR</math>.</p> <p>7. Find <math>m\angle ROS</math>.</p>
Find the measure of x. C is the center of each circle and all lines that appear tangent are tangent.	
<p>8.</p> <div data-bbox="181 1272 529 1472" data-label="Image"> </div>	<p>9.</p> <div data-bbox="631 1289 953 1545" data-label="Image"> </div>
<p>11.</p> <div data-bbox="126 1654 430 1885" data-label="Image"> </div>	<p>12.</p> <div data-bbox="677 1633 920 1871" data-label="Image"> </div>
<p>10.</p> <div data-bbox="1154 1272 1398 1482" data-label="Image"> </div>	<p>13.</p> <div data-bbox="1114 1654 1408 1892" data-label="Image"> </div>

**PART II: COMPLETE WALK-AROUND PROBLEMS.**

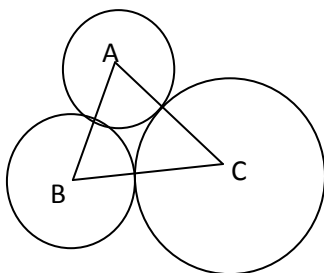
14. Circle P is tangent to each side of ABCD.  
AB=20, BC=11, and DC=14. Let AQ=x and find AD.



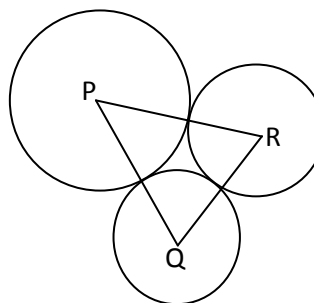
15. Each side of quadrilateral ABCD is tangent to the circle.  
AB=10, BC=15, AD=18. Find CD.



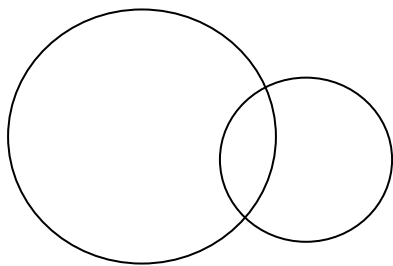
16. Circles A, B, and C are tangent.  
AB=8, BC=13, AC=11. Find the length of each radius.



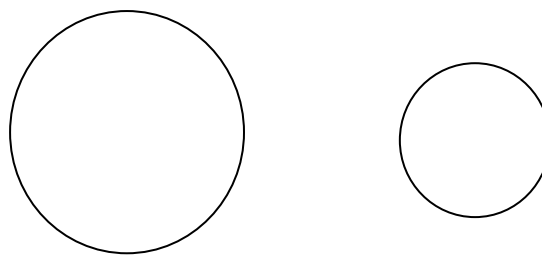
17. Circles P, Q, and R are tangent.  
PQ=20, QR=12, PR=15. Find the length of each radius.

**PART III: COMPLETE COMMON EXTERNAL TANGENT PROBLEMS.**

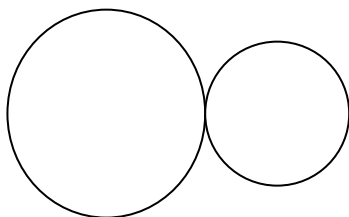
18. The centers of two circles of radii 10 cm and 5 cm are 13 cm apart. Find the length of a common external tangent.



19. The centers of two circles of radii 15 and 8 are 25 units apart. Find the length of a common external tangent.



20. A circle with a radius of 8 cm is externally tangent to a circle with a radius of 18 cm. Find the length of a common external tangent.



21. If the radii of two externally tangent circles are 9 cm and 6 cm, find the length of the common external tangent.

