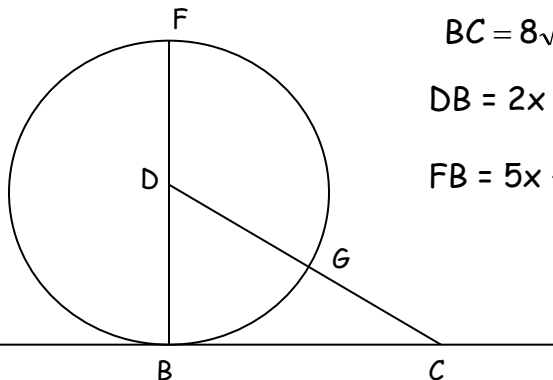


Directions: Find the value of each indicated variable and measure.

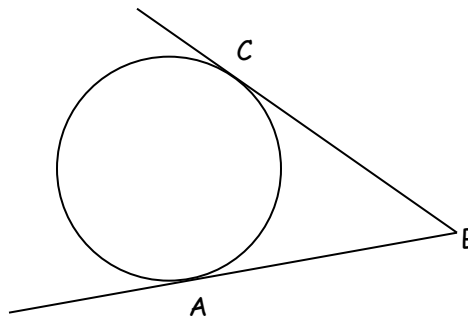
1. AC is a tangent of Circle D.



$BC = 8\sqrt{3}$   
 $DB = 2x + 2$   
 $FB = 5x + 1$

$x =$  \_\_\_\_\_       $DB =$  \_\_\_\_\_  
 $FB =$  \_\_\_\_\_       $m\angle DBC =$  \_\_\_\_\_  
 $m\angle DCB =$  \_\_\_\_\_       $DC =$  \_\_\_\_\_  
 $GC =$  \_\_\_\_\_

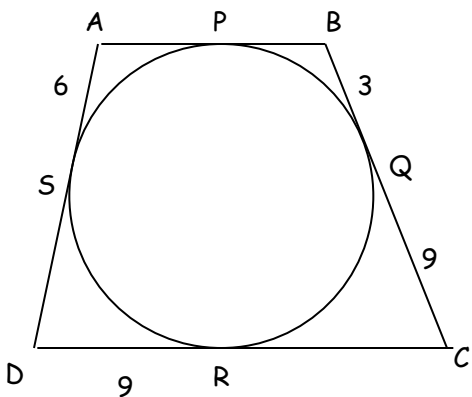
2. BC and AB are tangents to the circle.



$AB = 4x + 8$   
 $CB = 7x + 2$

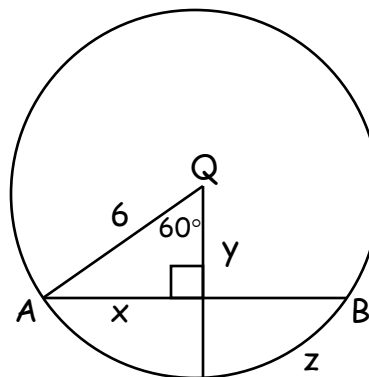
$x =$  \_\_\_\_\_  
 $AB =$  \_\_\_\_\_  
 $BC =$  \_\_\_\_\_

3. P, Q, R, and S are points of tangency.



Find the perimeter of Quadrilateral ABCD.

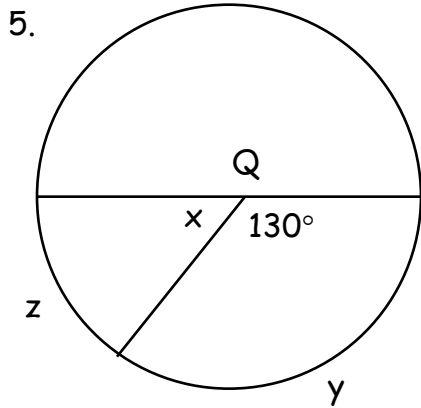
4.



$\widehat{AB} = 120^\circ$

$x =$  \_\_\_\_\_  
 $y =$  \_\_\_\_\_  
 $z =$  \_\_\_\_\_

z refers to an arc measure.



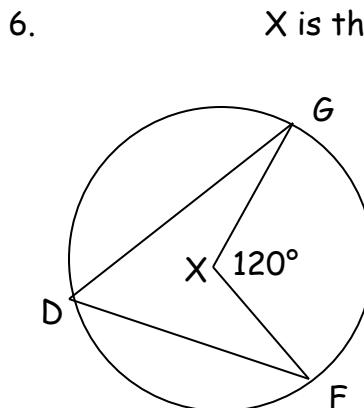
Q is the center of the circle.

$x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_

$z =$  \_\_\_\_\_

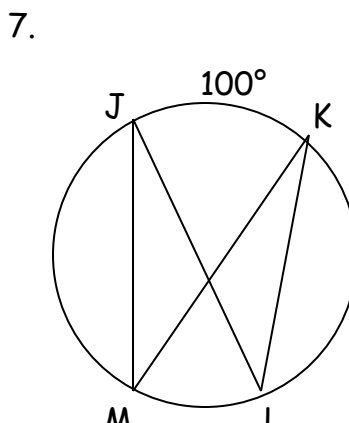
y and z refers to arc measures.



X is the center of the circle.

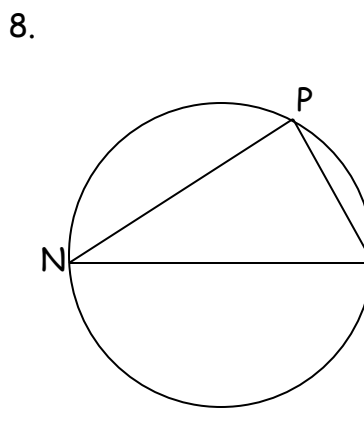
$m\widehat{GF} =$  \_\_\_\_\_

$m\angle GDF =$  \_\_\_\_\_



$m\angle JMK =$  \_\_\_\_\_

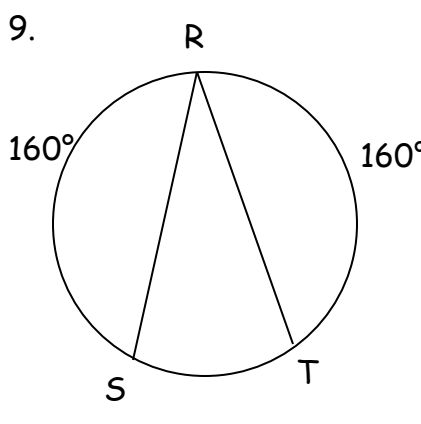
$m\angle JLK =$  \_\_\_\_\_



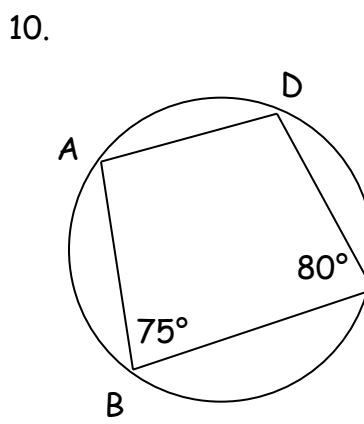
NQ is a diameter

$m\angle NPQ =$  \_\_\_\_\_

$m\angle N =$  \_\_\_\_\_



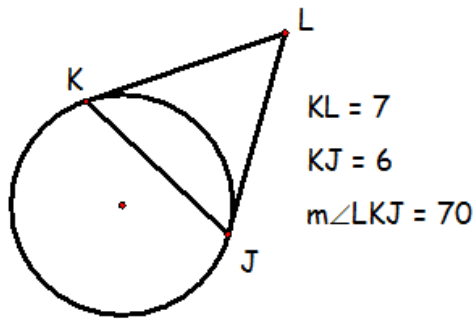
$m\angle SRT =$  \_\_\_\_\_



$m\angle ADC =$  \_\_\_\_\_

$m\angle BAD =$  \_\_\_\_\_

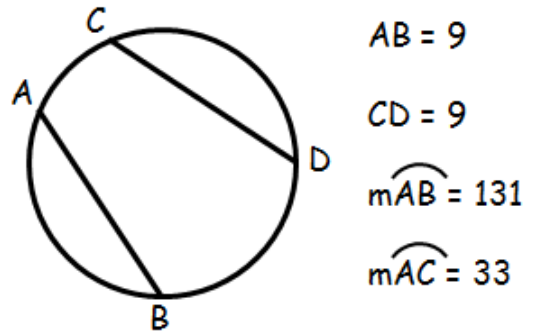
11.



Points K and J are points of Tangency.

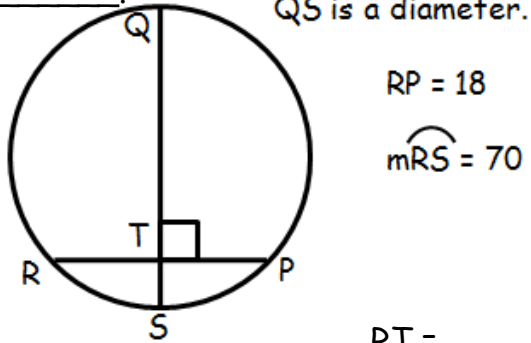
JL = \_\_\_\_\_  $m\angle KLJ =$  \_\_\_\_\_  
 $m\angle LJK =$  \_\_\_\_\_  $\triangle K LJ$  is \_\_\_\_\_

12.



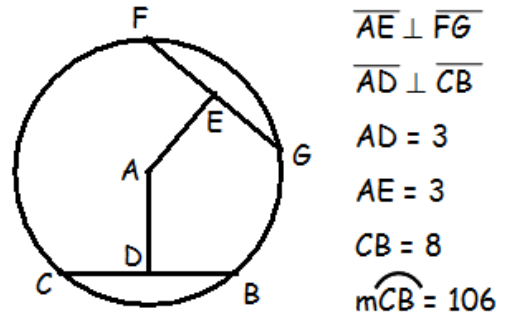
$m\angle CD =$  \_\_\_\_\_  $m\angle ACD =$  \_\_\_\_\_  
 $m\angle BD =$  \_\_\_\_\_  $m\angle ABC =$  \_\_\_\_\_

13.  $\overline{QS}$  is a diameter.



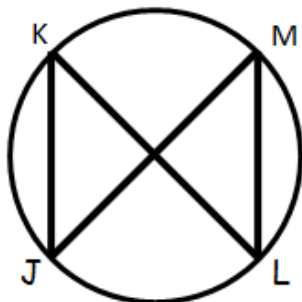
RT = \_\_\_\_\_  
 PT = \_\_\_\_\_  
 $m\angle SP =$  \_\_\_\_\_  $m\angle RP =$  \_\_\_\_\_  
 $m\angle RQ =$  \_\_\_\_\_  $m\angle RQP =$  \_\_\_\_\_

14.



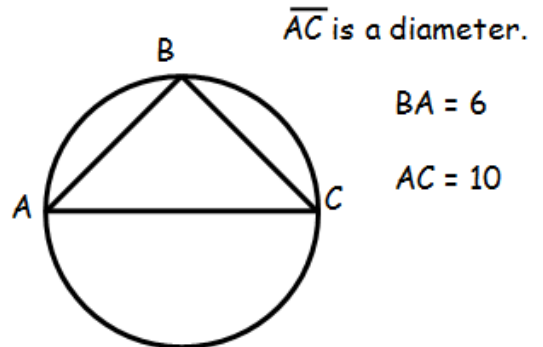
$\overline{AE} \perp \overline{FG}$   
 $\overline{AD} \perp \overline{CB}$   
 $m\angle CB = 106$   
 $CD =$  \_\_\_\_\_  $AC =$  \_\_\_\_\_  
 $m\angle FG =$  \_\_\_\_\_

15.  $m\angle KJM = 71$



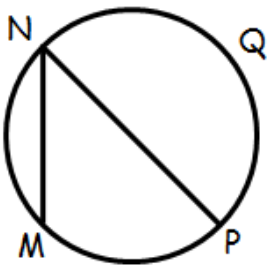
$m\angle KLM =$  \_\_\_\_\_  $m\angle KM =$  \_\_\_\_\_  
 $m\angle KJM =$  \_\_\_\_\_  
 KM is a \_\_\_\_\_ Arc

16.



$\overline{AC}$  is a diameter.  
 $BA = 6$   
 $AC = 10$   
 $BC =$  \_\_\_\_\_  
 $m\angle BAC =$  \_\_\_\_\_  
 $m\angle BC =$  \_\_\_\_\_  
 ABC is a \_\_\_\_\_.

17.



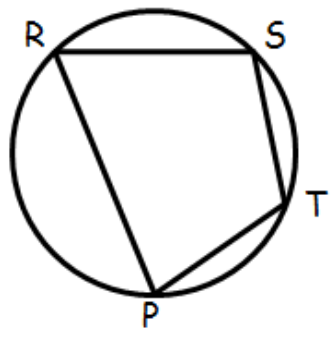
$m\widehat{MP} = 122$   
 $m\widehat{MN} = 40$

$m\angle MNP = \underline{\hspace{2cm}}$

$m\angle NQP = \underline{\hspace{2cm}}$

NQP is a \_\_\_\_\_ Arc

18.



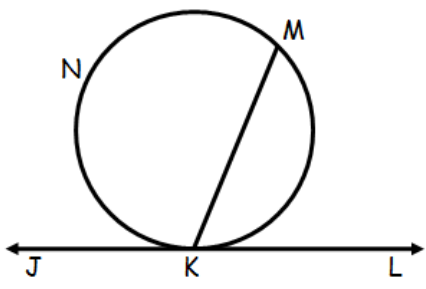
$m\angle RST = 102$   
 $m\angle SRP = 65$

$m\angle RPT = \underline{\hspace{2cm}}$      $m\angle STP = \underline{\hspace{2cm}}$

$m\angle RST = \underline{\hspace{2cm}}$

$m\angle PRS = \underline{\hspace{2cm}}$

19.



K is a point of tangency.

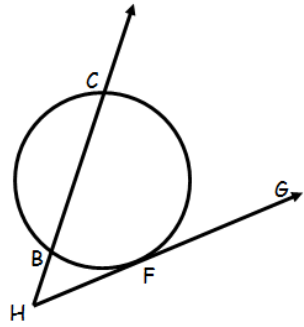
$m\angle MKL = 74$

$m\widehat{MK} = \underline{\hspace{2cm}}$

$m\angle MKJ = \underline{\hspace{2cm}}$

$m\angle KNM = \underline{\hspace{2cm}}$

20.



F is a point of tangency.

$m\widehat{CF} = 120$

$m\widehat{BF} = 50$

Line BC is a \_\_\_\_\_.

Segment BC is a \_\_\_\_\_.

Line HG is a \_\_\_\_\_.

$m\angle BHF = \underline{\hspace{2cm}}$

$\overline{PA}$  and  $\overline{PD}$  are tangent to  $\odot O$  at  $A$  and  $D$ , respectively.  $m\widehat{AB} = 90$ ,  $m\widehat{BC} = 20$ ,  $m\widehat{CD} = 100$ . Find each of the following.

12.  $m\widehat{AE}$

13.  $m\widehat{DE}$

14.  $m\angle 1$

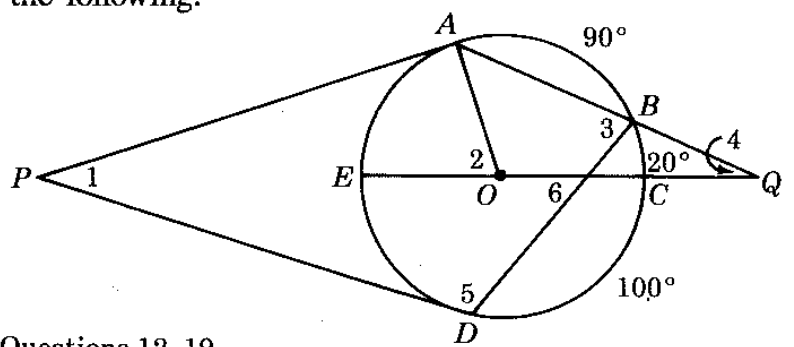
15.  $m\angle 2$

16.  $m\angle 3$

17.  $m\angle 4$

18.  $m\angle 5$

19.  $m\angle 6$



Questions 12-19