

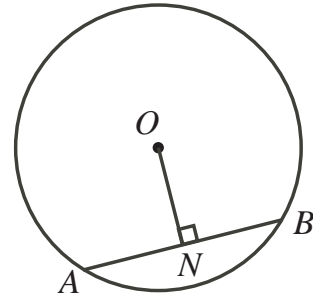


# Intermediate Math Circles

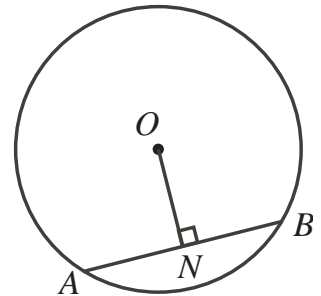
## Wednesday October 22 2014

### Problem Set 3

1. Determine the length of the chord  $AB$  if  $OA = 5$  and  $ON = 3$ .



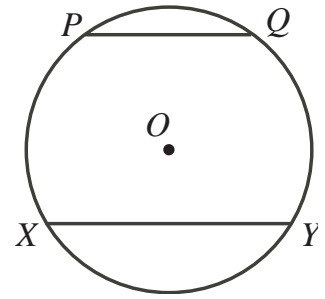
2. If  $AB = 10$  and  $OA = 13$ , determine the length of  $ON$ .



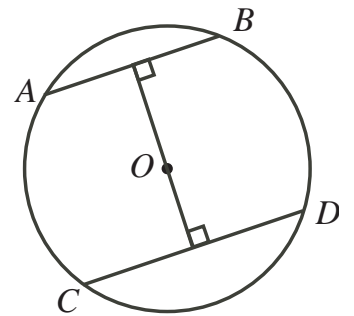
3. A circle has a diameter of length 26. If a chord of the same circle has a length of 10, how far is the chord from the centre?



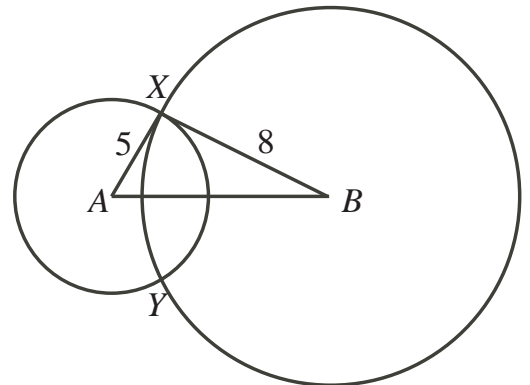
4. Calculate the distance between the parallel chords  $PQ$  and  $XY$  if  $PQ = 6$ ,  $XY = 8$ , and the radius of the circle is 5.



5. The two parallel chords  $AB$  and  $CD$  are a distance of 14 apart. If  $AB$  has length 12 and the radius of the circle is 10, calculate the length of  $CD$ .

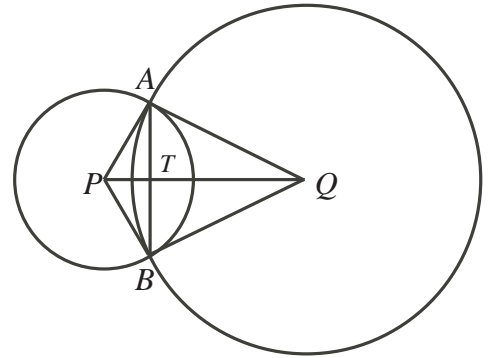


6. Two circles with centre  $A$  and  $B$  have radii 5 and 8, respectively. The circles intersect at the points  $X$  and  $Y$ . If  $XY = 8$ , determine the length of  $AB$ , the distance between the centres.

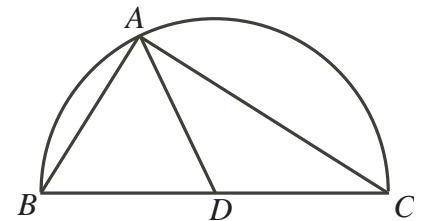




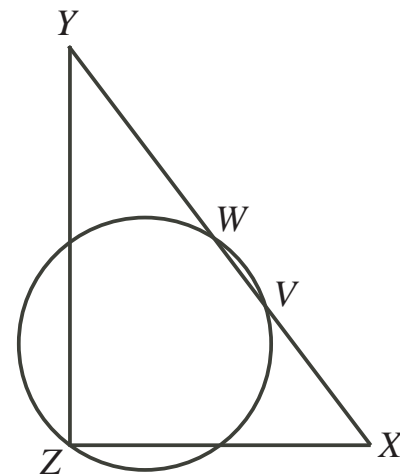
7. In the diagram,  $PA = 13$  and  $QA = 20$ , where  $P$  and  $Q$  are the centres of the circles. Determine the length of  $AB$  if  $PQ = 21$ .



8. In the diagram,  $\triangle ABC$  is inscribed in the semicircle with centre  $D$ . If  $AB = AD$ , determine the measure of  $\angle ACD$ .



9. In the diagram,  $\triangle XYZ$  is right-angled at  $Z$ .  $W$  is the midpoint of  $XY$ , and the circle with diameter  $ZW$  intersects  $WX$  at  $V$ . If  $XY = 50$  and  $WV = 7$ , determine the length of  $XZ$ .



### Answers

1. 8    2. 12    3. 12    4. 7    5. 16 m    6.  $4\sqrt{3} + 3$   
 7.  $\sqrt{20} = 2\sqrt{5}$     8.  $\frac{2}{3}$      $z = 30^\circ$     9. 30