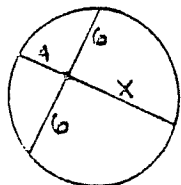


Geometry (H)  
Section 9.7 - Problems

KBY

Using the theorems we just proved and solve for x in the following problems.

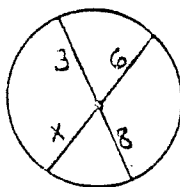
1.



$$4x = 36$$

$$x = 9$$

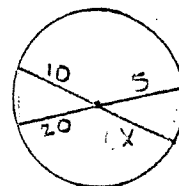
2.



$$6x = 24$$

$$x = 4$$

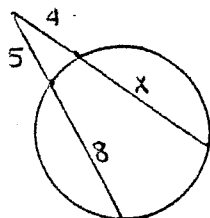
3.



$$10x = 100$$

$$x = 10$$

4.



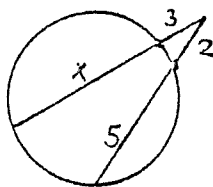
$$4(4+x) = 5(13)$$

$$16 + 4x = 65$$

$$4x = 49$$

$$x = \frac{49}{4}$$

5.



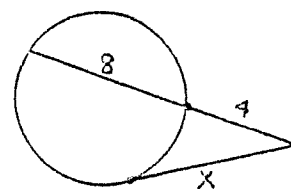
$$3(3+x) = 2(7)$$

$$9 + 3x = 14$$

$$3x = 5$$

$$x = \frac{5}{3}$$

6.



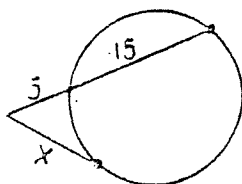
$$x^2 = 4(12)$$

$$x^2 = 48$$

$$x = \sqrt{16 \cdot 3}$$

$$x = 4\sqrt{3}$$

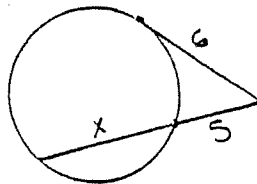
7.



$$x^2 = 5(20)$$

$$x = 10$$

8.



$$6^2 = 5(x+5)$$

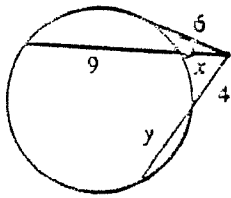
$$36 = 5x + 25$$

$$11 = 5x$$

$$x = \frac{11}{5}$$

9. Find each variable.

a.



$$6^2 = x(x+9)$$

$$36 = x^2 + 9x$$

$$0 = x^2 + 9x - 36$$

$$0 = (x+12)(x-3)$$

$$x = -12 \quad x = 3$$

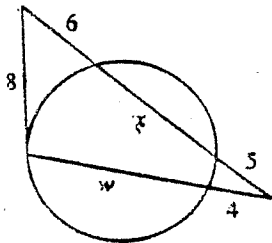
OMIT

$$4(y+4) = 3(12)$$

$$y+4 = 9$$

$$y = 5$$

b.



$$5(x+5) = 4(w+4) \quad 8^2 = 6(6+x)$$

$$5\left(\frac{14}{3} + \frac{15}{3}\right) = 4w + 16 \quad 64 = 36 + 6x$$

$$5\left(\frac{29}{3}\right) - 16 = 4w$$

$$28 = 6x$$

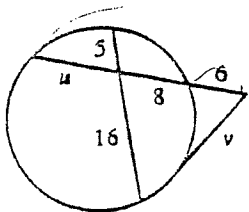
$$\frac{145}{3} - \frac{48}{3} = 4w$$

$$x = \frac{14}{3}$$

$$\frac{1}{4} \times \frac{97}{3} = w$$

$$\frac{97}{12} = w$$

c.



$$v^2 = 6(14+u)$$

$$v^2 = 6(24)$$

$$v^2 = 144$$

$$v = 12$$

$$8u = 5(16)$$

$$8u = 80$$

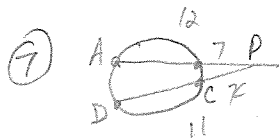
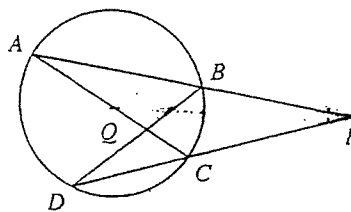
$$u = 10$$

Geometry (H)  
Section 9.7 - Problems

KEY

Note: #12 & 13 - only 1 answer!

7.  $AP = 12, PB = 7, PD = 11$  Find  $PC$ .
8.  $AQ = 8, QC = 3, BQ = 5$  Find  $QD$ .
9.  $AB = 9, BP = 10, PD = 18$  Find  $CD$ .
10.  $AC = 12, AQ = 8, BQ = 5$  Find  $BD$ .
11.  $AB = 8, AP = 17, CD = 7$  Find  $DP$ .
12.  $BD = 18, AC = 14, CQ = 5$  Find  $BQ$ .
13.  $AC = 15, BQ = 9, QD = 4$  Find  $AQ$  and  $CQ$ .

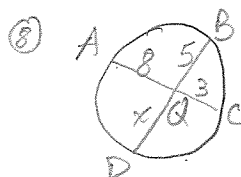


$$7(12) = 11x$$

$$84 = 11x$$

$$\frac{84}{11} = x$$

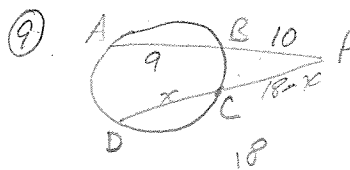
$$\boxed{PC = \frac{84}{11}}$$



$$3(8) = 5x$$

$$\frac{24}{5} = x$$

$$\boxed{QD = \frac{24}{5}}$$



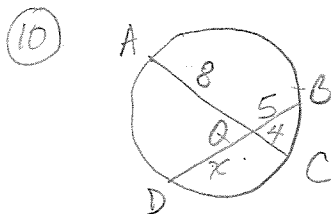
$$10(19) = 18(18-x)$$

$$190 = 324 - 18x$$

$$18x = 134$$

$$x = \frac{134}{18} = \frac{67}{9}$$

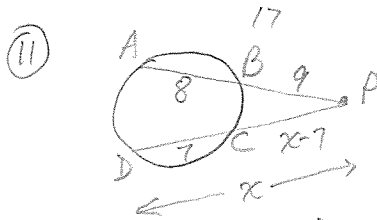
$$\boxed{CD = \frac{67}{9}}$$



$$32 = 5x$$

$$\frac{32}{5} = x$$

$$\boxed{BD = 6\frac{2}{5} + 5 = 11\frac{2}{5}}$$



$$9(17) = x(x-7)$$

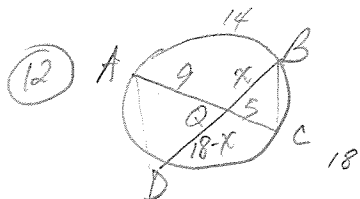
$$153 = x^2 - 7x$$

$$0 = x^2 - 7x - 153$$

$$x = \frac{7 \pm \sqrt{49 - 4(-153)}}{2}$$

$$x = \frac{7 \pm \sqrt{661}}{2}$$

$$\boxed{DP = \frac{7 \pm \sqrt{661}}{2}}$$



$$9(5) = x(18-x)$$

$$45 = 18x - x^2$$

$$x^2 - 18x + 45 = 0$$

$$(x-15)(x-3) = 0$$

$$x=15, x=3$$

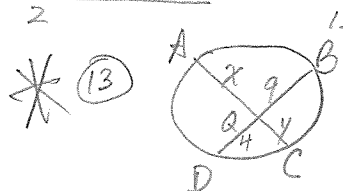
$$\frac{ck}{x=15}$$

$$9(5) = 15(3)$$

$$x=3$$

$$9(5) = 3(15)$$

$$\boxed{BQ = 15}$$



$$9(4) = xy \quad x+y=15$$

$$36 = y(15-y) \quad x=15-y$$

$$36 = 15y - y^2$$

$$y^2 - 15y + 36 = 0$$

$$(y-12)(y-3) = 0$$

$$y=12, y=3$$

$$\boxed{x=3, y=12}$$

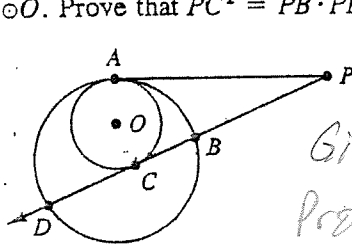
$$\boxed{x=1, y=3}$$

OMIT

$$\boxed{AQ=12}$$

$$\boxed{CQ=3}$$

20. Suppose that  $\overline{PA}$  and  $\overline{PC}$  are both tangent to  $\odot O$ . Prove that  $PC^2 = PB \cdot PD$ .



$$* \overline{PA} \cong \overline{PC}$$

Given:  $\overline{PA}$  &  $\overline{PC}$  tangent to  $\odot O$ .

Prove:  $PC^2 = PB \cdot PD$

①  $\overline{PA}$  &  $\overline{PC}$  tangent to  $\odot O$ .  $\rightarrow$  ②  $\overline{PA} \cong \overline{PC} \rightarrow$  ③  $PA = PC$  }  $\rightarrow$  ⑤  $PC^2 = PB \cdot PD$   
 ④  $PA^2 = PB \cdot PD$

① Given

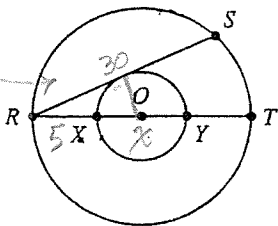
② 2 tangents to same  $\odot$  from same exterior pt are  $\cong$ .

③ def of  $\cong$  seg.

④ tangent<sup>2</sup> = (secant seg)(exterior sec.)

⑤ substitution

23. In the figure  $O$  is the center of two concentric circles.  $\overline{RS}$  is tangent to the smaller circle. If  $RX = 5$  and  $RS = 30$ , find  $XY$ .



draw  $\perp$ , bisects chord

Let  $x = XY$

$$\tan^2 = (\text{ext})(\text{sec})$$

$$15^2 = (5)(5+x)$$

$$225 = 25 + 5x$$

$$200 = 5x$$

$$40 = x$$

$$XY = 40$$