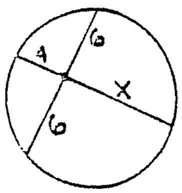
KEY

Geometry (H)
Section 9.7 - Problems

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

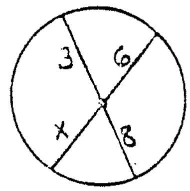
1.




$4x = 36$

$x = 9$

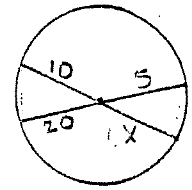
2.




$6x = 24$

$x = 4$

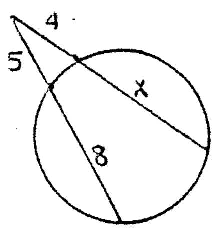
3.




$10x = 100$

$x = 10$

4.



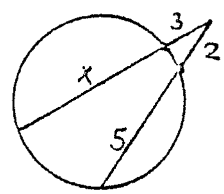

$4(4+x) = 5(13)$

$16 + 4x = 65$

$4x = 49$

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

5.



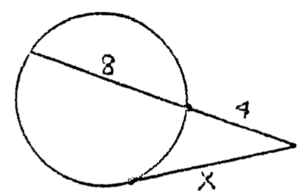

$3(3+x) = 2(7)$

$9 + 3x = 14$

$3x = 5$

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

6.



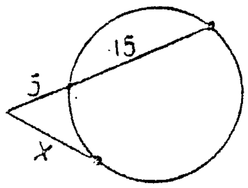

$x^2 = 4(12)$

$x^2 = 48$

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

$4\sqrt{3}$

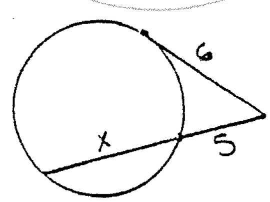
7.




$x^2 = 5(20)$

$x = 10$

8.




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

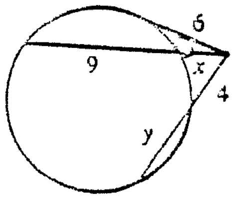
$36 = 5x + 25$

$11 = 5x$

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

9. Find each variable.

a.




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

$36 = x^2 + 9x$

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

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

$x = -12$ $x = 3$

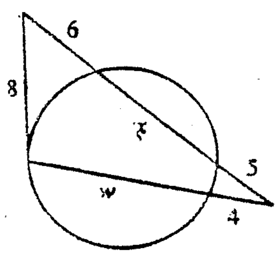
OMIT

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

$y + 4 = 9$

$y = 5$

b.




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

$5\left(\frac{14}{3} + \frac{15}{3}\right) = 4w + 16$

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

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

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

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

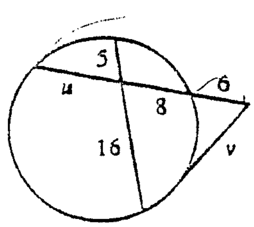
$8^2 = 6(6+x)$

$64 = 36 + 6x$

$28 = 6x$

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

c.




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

$v^2 = 6(24)$

$v^2 = 144$

$v = 12$

$8u = 5(16)$

$8u = 80$

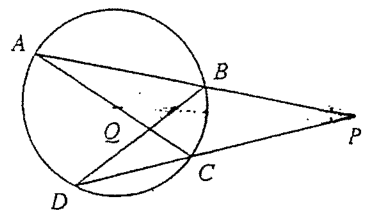
$u = 10$

KEY

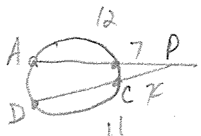
Geometry (H)
Section 9.7 - Problems

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)



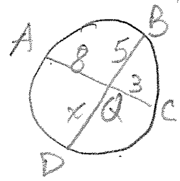
$7(12) = 11x$

$84 = 11x$

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

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

(8)

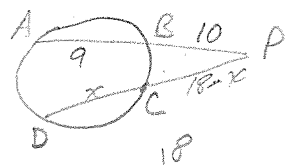


$3(8) = 5x$

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

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

(9)



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

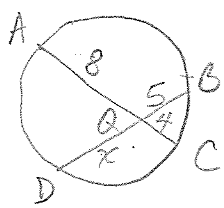
$190 = 324 - 18x$

$18x = 134$

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

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

(10)

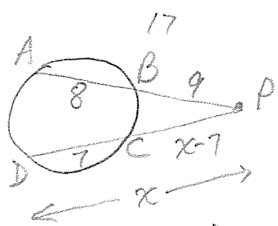


$32 = 5x$

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

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

(11)



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

$153 = x^2 - 7x$

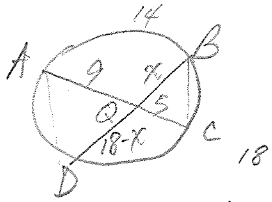
$0 = x^2 - 7x - 153$

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

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

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

(12)



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

$45 = 18x - x^2$

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

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

$x = 15, \quad x = 3$ ← OMIT

ck

$x = 15$

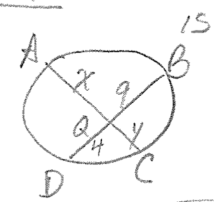
$9(5) \stackrel{\checkmark}{=} 15(3)$

$x = 3$

$9(5) \stackrel{\checkmark}{=} 3(15)$

$\boxed{BQ = 15,}$

* (13)



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

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

$36 = 15y - y^2$

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

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

$y = 12, \quad y = 3$

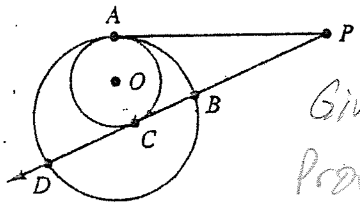
$x = 3$
$y = 12$

OMIT

$x = 1$[illegible]
$y = 3$

$AQ = 12$
$QC = 3$

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 $\odot O$. → ② $\overline{PA} \cong \overline{PC}$ → ③ $PA = PC$ } → ⑤ $PC^2 = PB \cdot PD$

④ $PA^2 = PB \cdot PD$ }

① Given

② 2 tangents to same ⊙ from same exterior pt are ≅.

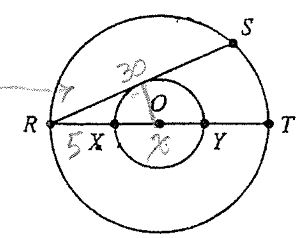
③ def of ≅ seg.

④ tangent$^2$ = (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 ⊥, bisects chord




Let $x = XY$

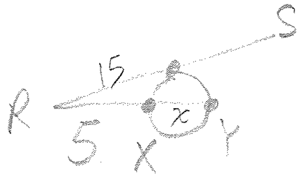
$\tan^2 = (ext)(sec)$

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

$225 = 25 + 5x$

$200 = 5x$

$40 = x$




$XY = 40$