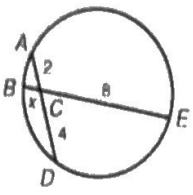
Name M Date Class

LESSON 15-4

Segment Relationships in Circles

Practice and Problem Solving: A/B

For each figure, determine the value of the variable and the indicated lengths by applying the Chord-Chord Product Theorem.

1. 

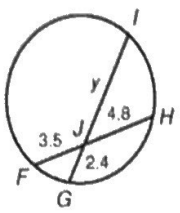
$x =$ 1

$AD =$ 2+4=6

$BE =$ 1+8=9

$BC \cdot CE = AC \cdot AD$

$x = 1$

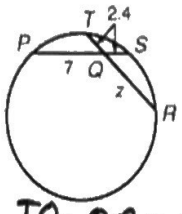
2. 

$y =$ 7

$FH =$ 3.5+4.8=8.3

$GI =$ 7+2.4=9.4

$FJ \cdot JH = GJ \cdot JI$

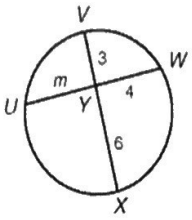
3. 

$z =$ 7

$PS =$ 7+2.4=9.4

$RT =$ 7+2.4=9.4

$TQ \cdot QR = PQ \cdot QS$

4. 

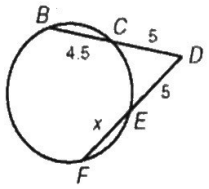
$m =$ 4.5

$UW =$ 4.5+4 = 8.5

$VX =$ 3+6=9

$VY \cdot YX = UY \cdot YW$

For each figure, determine the value of the variable and the indicated lengths by applying the Secant-Secant Product Theorem.

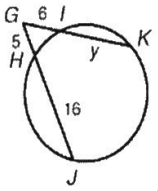
5. 

$x =$ 4.5

$BD =$ 4.5+5=9.5

$FD =$ 4.5+5=9

$BD \cdot CD = FD \cdot ED$

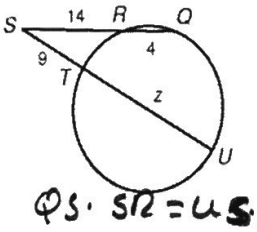
6. 

$y =$ 11.5

$GJ =$ 5+16=21

$GK =$ 6+11.5=17.5

$KG \cdot IG = JG \cdot KG$

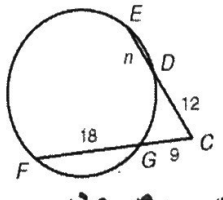
7. 

$z =$ 19

$SQ =$ 14+4=18

$SU =$ 9+19=28

$QS \cdot SR = US \cdot ST$

8. 

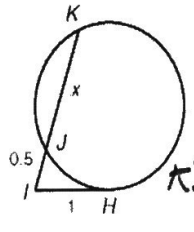
$n =$ 8.25

$CE =$ 8.25+12 = 20.25

$CF =$ 18+9=27

$EC \cdot DC = FC \cdot GC$

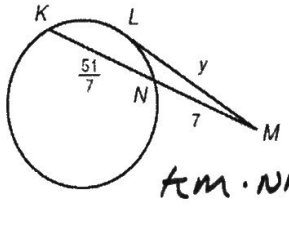
For each figure, determine the value of the variable and the indicated length by applying the Secant-Tangent Product Theorem.

9. 

$x =$ 1.5

$IK =$ 1.5+.5 = 2

$KI \cdot JI = (IH)^2$

10. 

$y =$ 10

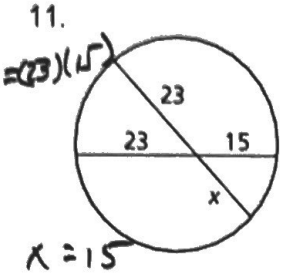
$KM =$ $\frac{100}{7}$ OR $14\frac{2}{7}$

$KM \cdot NM = (LM)^2$

Name _____ Date _____ Class _____

In Exercises 11–28, find the value of *x*.

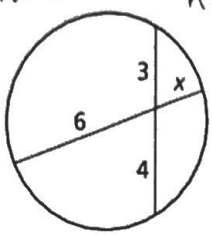
11.



$(23)(x) = (23)(15)$

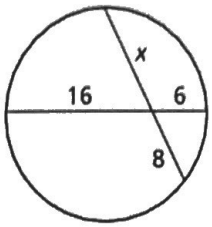
$x = 15$

12.



$(6)(x) = (3)(4)$ $x = 2$

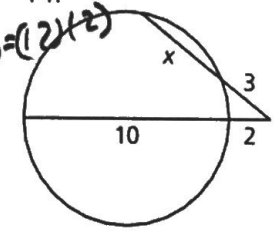
13.



$(8)(x) = (16)(6)$

$x = 12$

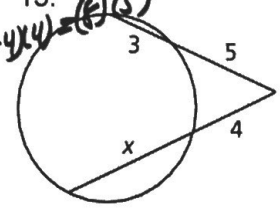
14.



$(x+3)(3) = (12)(2)$

$x = 5$

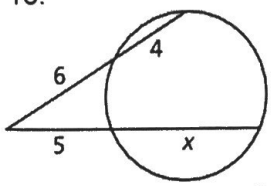
15.



$(x+4)(4) = (6)(5)$

$x = 6$

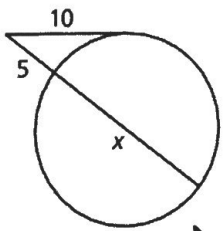
16.



$(x+5)(5) = (10)(6)$

$x = 7$

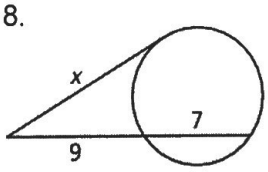
17.



$(x+5)(5) = (10)^2$

$x = 15$

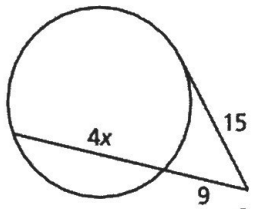
18.



$(16)(9) = (x)^2$

$x = 12$

19.

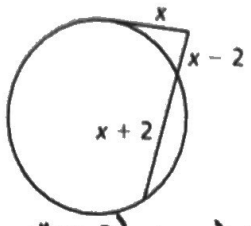


$(4x+9)(9) = (15)^2$

$x = 7$

Name _____ Date _____ Class _____

20.

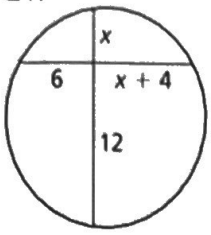


$(x+2)(x-2) = (x)^2$

$x = 0$ & $x = 4$

$x = 4$

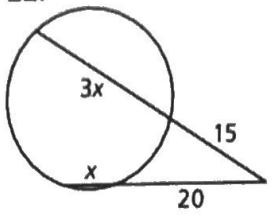
21.



$(12)(x) = (6)(x+4)$

$x = 4$

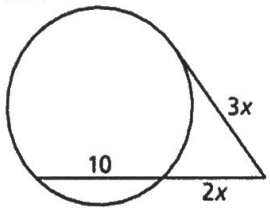
22.



$(3x+15)(15) = (x+20)(x)$

$x = 7$

23.

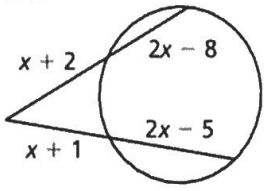


$(10+2x)(2x) = (3x)^2$

$x = 0$ & $x = 4$

$x = 4$

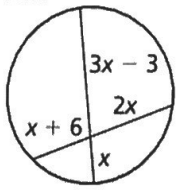
24.



$(2x-8+x+2)(x+2) = (2x-5+x+1)(x+1)$

$x = 8$

25.

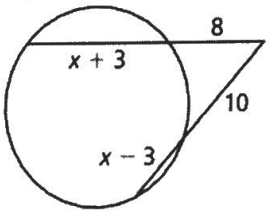


$(3x-3)(x) = (2x)(x+6)$

$x = 0$ & $x = 15$

$x = 15$

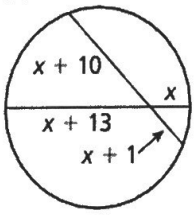
26.



$(x+3)(8) = (x-3+10)(10)$

$x = 9$

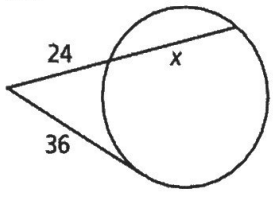
27.



$(x+10)(x+1) = (x+13)(x)$

$x = 5$

28.

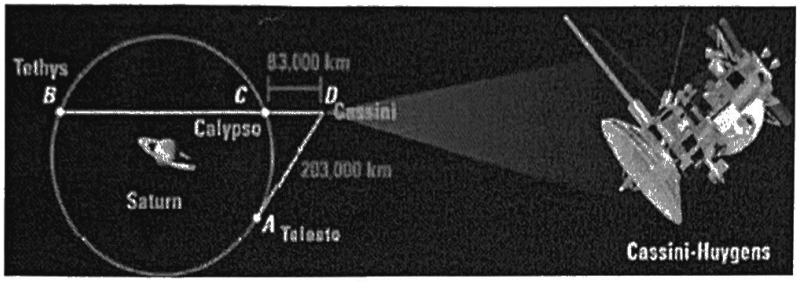


$(x+24)(24) = (36)^2$

$x = 30$

Name _____ Date _____ Class _____

29. Tethys, Calypso, and Telesto are three of Saturn's moons. Each has a nearly circular orbit 295,000 kilometers in radius. The Cassini-Huygens spacecraft entered Saturn's orbit in July 2004. Telesto is on a point of tangency. Find the distance *DB* from Cassini to Tethys.

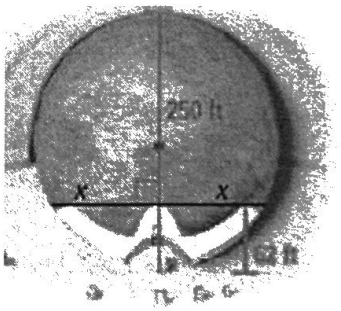


$(BC+CD)(CD) = (AD)^2$

$BC \approx 413493.9759$

$\approx 413,493$ km

30. The circular stone mound in Ireland called Newgrange has a diameter of 250 feet. A passage 62 feet long leads toward the center of the mound. Find the perpendicular distance *x* from the end of the passage to either side of the mound.

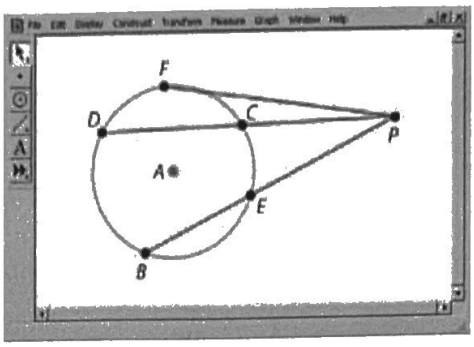


$X \approx 107.9$ ft

≈ 108 ft

Name _____ Date _____ Class _____

16. Tangent $\overleftrightarrow{PF}$ and secants $\overleftrightarrow{PD}$ and $\overleftrightarrow{PB}$ are drawn to circle A. Determine whether each of the following relationships is true or false. Select the correct answer for each lettered part.



a. $PB \cdot EB = PD \cdot DC$	○ True	✓ False
b. $PE \cdot EB = PC \cdot DC$	○ True	✓ False
c. $PB \cdot PE = PF^2$	✓ True	○ False
d. $PB \cdot DC = PD \cdot EB$	○ True	✓ False
e. $PB \cdot PE = PD \cdot PC$	✓ True	○ False
f. $PB \cdot PE = PF \cdot PC$	○ True	✓ False