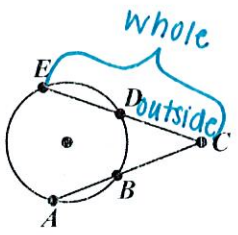
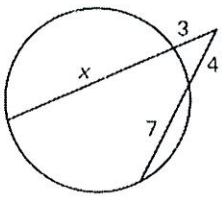
Name _____ Date _____

Day 2 – Segment Lengths: Tangents and Secants

Secant Segment Theorem	If two secant segments intersect in the exterior of a circle, then the product of the lengths of the secant segment and its external secant segment is equal to the product of the lengths of the second secant segment and its external secant segment.		If EC and AC intersect outside of the circle, then DC(EC) = BC(AC) outside(whole) = outside(whole)

Example: Find x.



$3(3+x) = 4(4+7)$

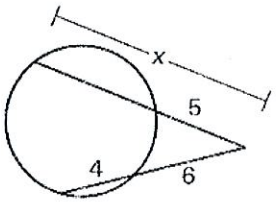
$9 + 3x = 4(11)$

$3x + 9 = 44$

$3x = 35$

$x = 11.67$

Example: Find x.



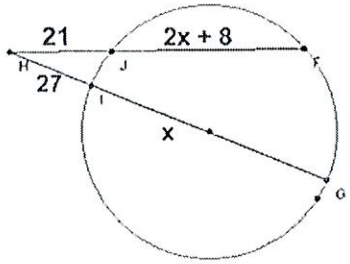
$5(x) = 6(6+4)$

$5x = 6(10)$

$5x = 60$

$x = 12$

Example: Find x and then JF.



$21(21+2x+8) = 27(27+x)$

$21(2x+29) = 27(x+27)$

$42x + 609 = 27x + 729$

$15x = 120$

$x = 8$

$JF = 2x + 8$

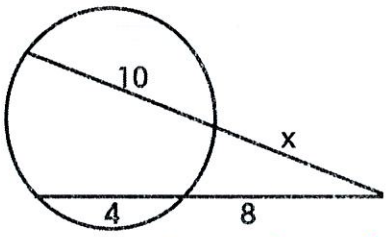
$= 2(8) + 8$

$= 16 + 8$

$= 24$

$JF = 24$

Example: Find x.



$x(x+10) = 8(8+4)$

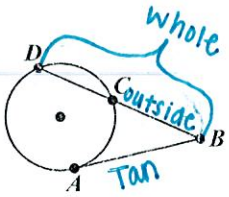
$x^2 + 10x = 96$

$x^2 + 10x - 96 = 0$

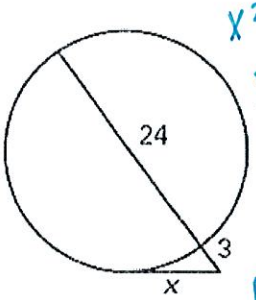
$(x+16)(x-6) = 0$

$x = -16$ and $x = 6$

$x = 6$

Secant Tangent Theorem	If a tangent and secant intersect in the exterior of a circle, then the product of the lengths of the secant segment and its external secant segment is equal to the square of the length of the tangent segment.		If DB and AB intersect outside of the circle, then $(AB)^2 = CB(DB)$ $Tan^2 = outside(whole)$

Example: Find x.



$x^2 = 3(3+24)$

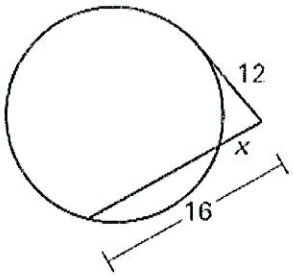
$x^2 = 3(27)$

$x^2 = 81$

$x = \pm 9$

$\boxed{x = 9}$

Example: Find x.



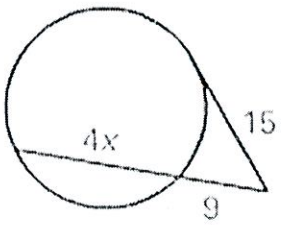
$12^2 = x(16)$

$144 = 16x$

$9 = x$

$\boxed{x = 9}$

Example: Find x.



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

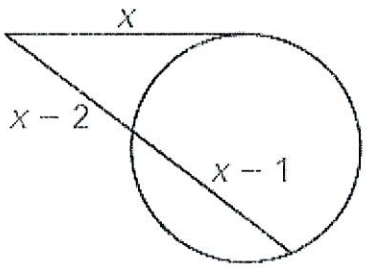
$225 = 81 + 36x$

$144 = 36x$

$4 = x$

$\boxed{x = 4}$

Example: Find all possible values of x.



$x^2 = (x-2)(x-2+x-1)$

$x^2 = (x-2)(2x-3)$

$x^2 = 2x^2 - 3x - 4x + 6$

$x^2 = 2x^2 - 7x + 6$

$0 = x^2 - 7x + 6$

$0 = (x-6)(x-1)$

$x = 6$ and ~~$x = 1$~~ * would result in a negative length

$\boxed{x = 6}$