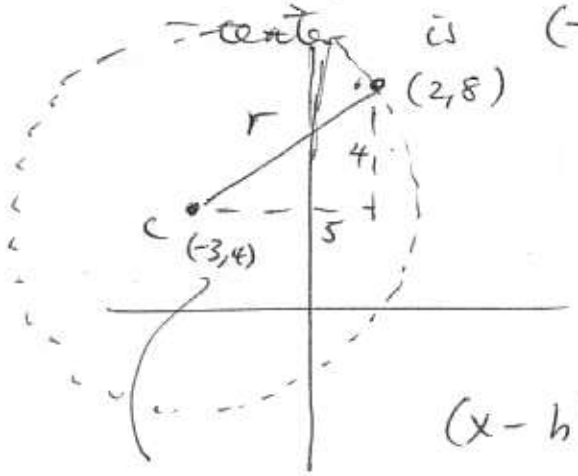
65

Circle passes through (2,8)

center is (-3, 4)



$r^2 = 5^2 + 4^2$

$r^2 = 25 + 16 = 41$

$(x-h)^2 + (y-k)^2 = r^2$

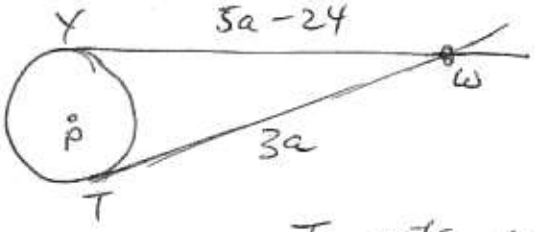
(-3,4)

(h, k)

$(x-(-3))^2 + (y-4)^2 = 41$

$(x+3)^2 + (y-4)^2 = 41$

66

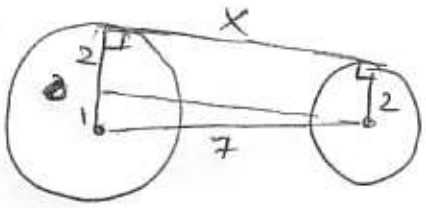


Tangents originating from the same point (W) must have the same lengths.

So $5a - 24 = 3a$

$2a = 24$

$a = 12$



$X = \sqrt{7^2 - 1^2} = \sqrt{49-1}$

$X = \sqrt{48} = \sqrt{16} \cdot \sqrt{3} = 4\sqrt{3}$

$ST = X = 4\sqrt{3}$

$SW = ST + TW$

$SW = 4\sqrt{3} + 3a = 4\sqrt{3} + 3(12) = 4\sqrt{3} + 36$