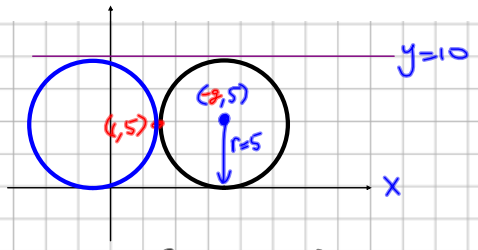
8. The x-axis and the line $y = 10$ are tangents to a circle.
If the circle also contains the point $(1, 5)$, find the equations of the two circles that satisfy these conditions.

notice: $-f = 5$



contains $(1,5)$ $\quad (1)^2 + (5)^2 + 2g(1) - 10(5) + c = 0$

$26 + 2g - 50 + c = 0$

$2g + c = 24$ (1)

touches x axes

$g^2 = c$ (2)

Sub (2) into (1) $\Rightarrow \quad 2g + g^2 = 24$

$g^2 + 2g - 24 = 0$

$(g-4)(g+6) = 0$

$g = 4, \quad g = -6$

Sub into (2) $\Rightarrow \quad c = (4)^2 = 16 \quad$ or $\quad c = (-6)^2 = 36$

equations $\quad x^2 + y^2 + 2gx + 2fy + c = 0$

S_1: $x^2 + y^2 + 8x - 10y + 16 = 0$

S_2: $x^2 + y^2 - 12x - 10y + 36 = 0$