

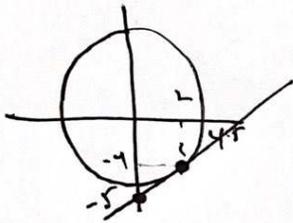


QT Proof of tangent

$$\begin{aligned}x &= 10 + 2y \\x - 10 &= 2y \\ \frac{1}{2}x - 5 &= y\end{aligned}$$

Prove algebraically that the straight line with the equation $x - 2y = 10$ is a tangent to the circle with equation $x^2 + y^2 = 20$

$$y = \frac{1}{2}x - 5$$



$$\begin{aligned}x &= 10 + 2y \\ &= 10 + 2(-4) \\ &= 10 - 8 \\ x &= 2.\end{aligned}$$

$\therefore (2, -4)$ point
of the tangent.

$$\begin{aligned}x^2 + y^2 &= 20 \\ (10 + 2y)^2 + y^2 &= 20 \\ (10 + 2y)(10 + 2y) + y^2 &= 20 \\ 100 + 40y + 4y^2 + y^2 &= 20 \\ 5y^2 + 40y + 80 &= 0 \\ y^2 + 8y + 16 &= 0 \\ (y + 4)(y + 4) &= 0 \\ \therefore y &= -4\end{aligned}$$