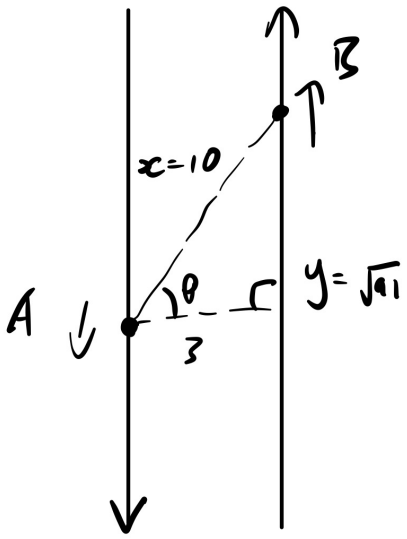
(Q1)



We complete this problem from car A's perspective. From that perspective, car B is travelling north at 130km/h. Thus, $\frac{dy}{dt} = 130$. We want $\frac{dx}{dt}$.
By Pythagoras' Theorem, we have $x^2 = y^2 + 9$. Differentiating both sides, we have

$$2x \cdot \frac{dx}{dt} = 2y \cdot \frac{dy}{dt} \implies \frac{dx}{dt} = \frac{2y \cdot \frac{dy}{dt}}{2x}$$

Since we know $x = 10$, by Pythagoras' Theorem:

$$100 = y^2 - 9 \implies y^2 = 91 \implies y = \sqrt{91}$$

Then,

$$\frac{dx}{dt} = \frac{2\sqrt{91} \cdot 130}{20} = 13\sqrt{91}$$

Thus, the rate of change of the distance between them is $13\sqrt{91}$ km/h.