Answer on Question # 83012, Math / Analytic Geometry

Question 1. *A line AB passes through the point $P(3, -2)$ with gradient $-1/2$, determine the equation of the line CD through P perpendicular to AB.*

Proof. Gradient of AB is $\tan\alpha = -1/2$. We have $AB \perp CD$ so gradient of CD is $\tan(1/2 + \pi/2) = -\cot\alpha = -1/\tan\alpha = 2$. So equation of the line CD is $y = 2x + c$. And $P(3, -2) \in CD$ then $-2 = 6 + c$, $c = -8$. So the answer is $y = 2x - 8$. □

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