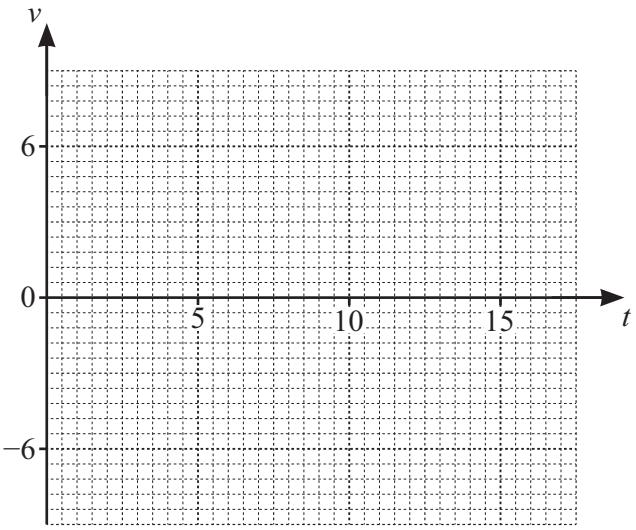
8 Solve the equation $\cot^2 2\theta + 3\operatorname{cosec} 2\theta = 9$ for $-90° \leqslant \theta \leqslant 90°$. [6]

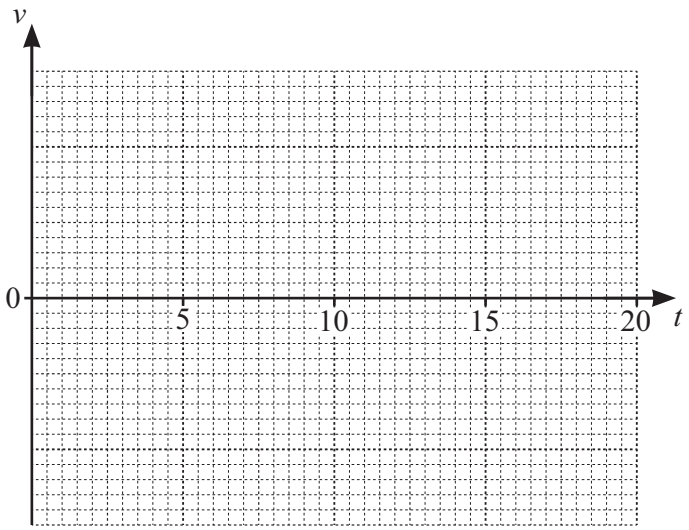
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9 In this question time is measured in seconds.

(a) A particle is moving in a straight line with constant velocity of $6\,\text{ms}^{-1}$. At time $t = 0$, it passes a fixed point A. At time $t = 5$ it suddenly changes direction and moves with a different constant velocity along the same straight line. It passes the point A again at time $t = 15$. Sketch the velocity–time graph for the motion. [3]



(b) Another particle is moving in a straight line with constant acceleration. At time $t = 0$ it passes a fixed point B with velocity $-8\,\text{ms}^{-1}$. It passes the point B again at time $t = 20$. Sketch the velocity–time graph for the motion. [3]



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