

**10** The equation of a curve is  $y = (5 - 2x)^{\frac{3}{2}} + 5$  for  $x < \frac{5}{2}$ .

- (a) A point  $P$  is moving along the curve in such a way that the  $y$ -coordinate of point  $P$  is decreasing at 5 units per second.

Find the rate at which the  $x$ -coordinate of point  $P$  is increasing when  $y = 32$ . [4]

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

- (b)** Point  $A$  on the curve has  $y$ -coordinate 32. Point  $B$  on the curve is such that the gradient of the curve at  $B$  is  $-3$ .

Find the equation of the perpendicular bisector of  $AB$ . Give your answer in the form  $ax + by + c = 0$ , where  $a$ ,  $b$  and  $c$  are integers. [6]

This image shows a full page of a worksheet designed for handwriting practice. It consists of multiple rows of horizontal dashed lines spaced evenly across the page, providing a guide for letter height and placement. The background is plain white, and there are no other markings or text present.