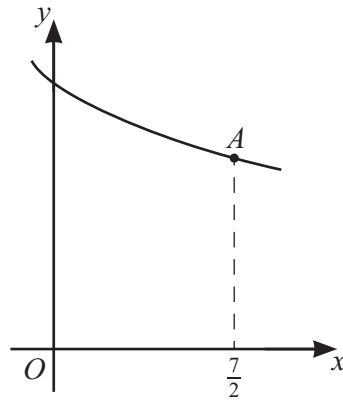


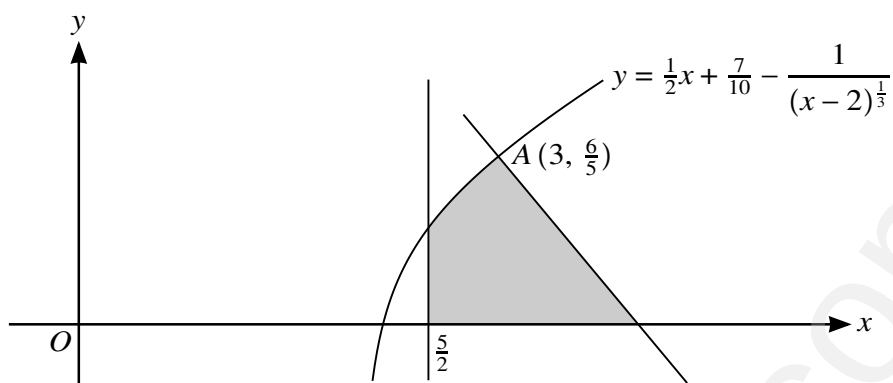
- [illegible]



The diagram shows part of the curve with equation $y = \frac{12}{\sqrt[3]{2x+1}}$. The point A on the curve has coordinates $\left(\frac{7}{2}, 6\right)$.

- (a) Find the equation of the tangent to the curve at A . Give your answer in the form $y = mx + c$. [4]

[illegible]



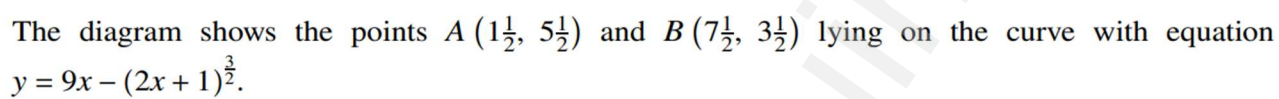
The diagram shows the line $x = \frac{5}{2}$, part of the curve $y = \frac{1}{2}x + \frac{7}{10} - \frac{1}{(x-2)^{\frac{1}{3}}}$ and the normal to the curve at the point $A(3, \frac{6}{5})$.

- (a) Find the x -coordinate of the point where the normal to the curve meets the x -axis. [5]

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. A faint watermark reading "pastpaperpenq" is visible diagonally across the center.

(a) Find the equation of the normal to the curve at the point $(4, 4)$, giving your answer in the form $y = mx + c$. [5]

[illegible]



- [illegible]

- 5** A curve has the equation $y = \frac{3}{2x^2 - 5}$.

Find the equation of the normal to the curve at the point $(2, 1)$, giving your answer in the form $ax + by + c = 0$, where a , b and c are integers. [6]

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

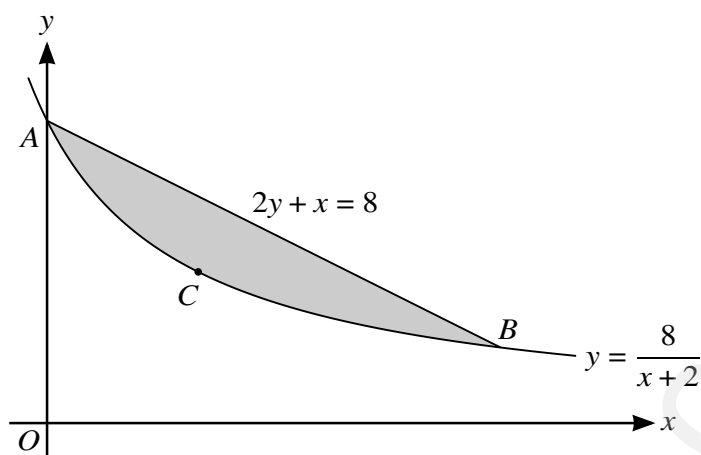
- (b) Point A on the curve has y -coordinate 32. Point B on the curve is such that the gradient of the curve at B is -3 .

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]

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(b) The tangent to the curve at a point X is parallel to the line $y + 2x = 0$. Show that X lies on the line $y = 2x$. [3]

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. A large, light gray watermark with the text "Pastpaperpen" is oriented diagonally from the bottom left towards the top right, spanning most of the page's width and height.



(a) Find, by calculation, the coordinates of A , B and C . [6]

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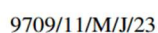
11 The equation of a curve is

$$y = k\sqrt{4x + 1} - x + 5,$$

where k is a positive constant.

- (c) Given that $k = 10.5$, find the equation of the normal to the curve at the point where the tangent to the curve makes an angle of $\tan^{-1}(2)$ with the positive x -axis. [4]

[illegible]



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