Air maths tuition

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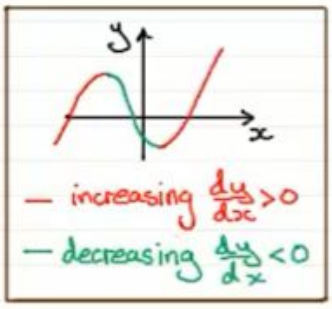
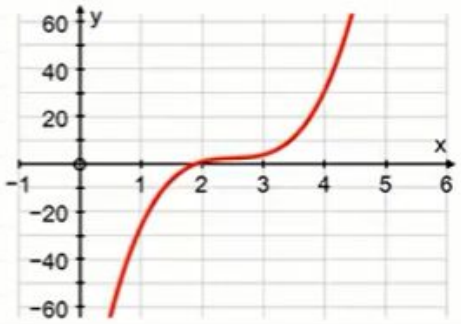
Increasing Functions | Past Paper Question | P1 CIE June 2013 Q1

It is given that $f(x) = (2x-5)^3 + x$, for $x \in \mathbb{R}$. Show that f is an increasing function. [3]





$f(x) = (2x-5)^3 + x$

$\therefore f'(x) = 3(2x-5)^2(2) + 1$

$= 6(2x-5)^2 + 1$

Since $(2x-5)^2 > 0$

$\therefore f'(x) > 0 \quad x \in \mathbb{R}$

$\frac{dy}{dx} = \frac{dy}{dt} \times \frac{dt}{dx}$

let $t = 2x-5 \Rightarrow y = t^3$

$\therefore \frac{dy}{dx} = 3(2x-5)^2(2)$

With the acknowledgement of Exam Solutions.

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