

13	11g	Differentiate $x^2 \sin^{-1} 5x$.	2
$\frac{d}{dx} [x^2 \sin^{-1} 5x] = x^2 \cdot \frac{1}{\sqrt{1 - (5x)^2}} \cdot 5 + 2x \cdot \sin^{-1} 5x$ $= \frac{5x^2}{\sqrt{1 - 25x^2}} + 2x \sin^{-1} 5x$			State Mean: 1.55/2

* These solutions have been provided by [projectmaths](http://projectmaths.com.au) and are not supplied or endorsed by the Board of Studies

Board of Studies: Notes from the Marking Centre

The constant 5 in the function $x^2 \sin^{-1} 5x$ proved troublesome, with only about half the candidature providing a correct solution.

Common problems were:

- understanding the notation $\sin^{-1} 5x$ but not being able to differentiate it correctly;

common incorrect derivatives were $\frac{1}{\sqrt{1 - 25x^2}}$, $\frac{1}{\sqrt{25 - x^2}}$, $\frac{5}{\sqrt{\left(\frac{1}{5}\right)^2 - x^2}}$

- calculating or substituting the incorrect derivative of $\sin^{-1} 5x$ into an attempt to use the product rule
- writing $\sin^{-1} 5x = \frac{1}{\sin 5x}$.

Source: http://www.boardofstudies.nsw.edu.au/hsc_exams/