

The best way to review is to work these problems as if it were a test. Then you can check your answers. The relevant sections/examples to use for review will be posted along with the answers. Review and then use these to test yourself again!

1) Find the derivative for each of the functions: simplify your answers

a) $g(x) = \tan^{-1}(\sqrt{x})$

b) $h(x) = x \sin^{-1}(x)$

2) Evaluate the limit. You must show your reasoning in each case. Use calculus, not the graphs, to find the limit.

a) $\lim_{x \rightarrow \infty} \frac{x^3 - 5x^2}{e^{4x}}$

b) $\lim_{x \rightarrow 0^+} x^2 \ln x$

3) Find the absolute maximum and absolute minimum values of the function $f(x) = x^3 - 6x^2 + 9x + 1$ on the interval $[2, 4]$

4) For the function $f(x) = x^3 - 3x + 1$,

a) Find the intervals of increase and decrease

b) Find the local maxima and minima.

c) Find the intervals where the function is concave up and concave down

d) Find the inflection point(s), if there are any

5) For the function $f(x) = 3x^{2/3} - x$,

a) Find the intervals of increase and decrease

b) Find the local maxima and minima.

c) Find the intervals where the function is concave up and concave down

d) Find the inflection point(s), if there are any