

1) Find the derivative of each of the following:

a) $f(x) = e^{x^a} \sin(3x)$

b) $y = 3\cos(2x)/x^2$

2) Use the limit definition of the derivative to show that the derivative of $3x^2 - x$ is $6x - 1$.

3) Given : $f(x) = 4x^3 - x^4$

- Find all critical points.
- Indicate intervals where $f(x)$ is increasing; decreasing.
- Relative max or min.