

BC 213 Diagnostic Quiz

An important pre-requisite for this course is Math 10 (introductory calculus). This quiz will help you to assess your level of comfort with various mathematical tools that are needed for this course. Ideally, you should be able to answer each of these questions either on your own, or with quick reference to an appropriate source to refresh your memory.

1. For any function $f(x)$, what is quantified by its derivative $df(x)/dx$?
2. For any function $f(x)$, what is quantified by the definite integral $\int_a^b f(x) dx$?
3. At what point does the line $f(x) = 4x - 3$ intersect the vertical axis?
4. Differentiate each function with respect to x .
 - (a) $f(x) = 4x^3$
 - (b) $f(x) = e^x$
 - (c) $f(x) = e^{(a-x)^2}$ (here, a is a constant)
 - (d) $f(x) = \log x$ (here and throughout, \log is natural log)
 - (e) $f(x) = \log(ax)$
 - (f) $f(x) = 6/x$
5. Evaluate each integral.
 - (a) $\int_0^1 3x^2 dx$
 - (b) $\int_0^1 e^x dx$
6. Plot each function. Find its maximum or minimum value as appropriate.
 - (a) $f(x) = x^2 - 2x + 1$
 - (b) $f(x) = \exp(x - 4)^2$ (note, $\exp(x) = e^x$)
7. Evaluate each expression.
 - (a) $\sum_{j=1}^5 2^j$
 - (b) $4!$
 - (c) $\prod_{j=1}^3 (4j)$
8. Simplify each expression.
 - (a) $\log(ax^2) - \log(ax)$
 - (b) $e^{(ax^3)} - e^{(ax^2)}$
 - (c) $e^{\log x}$
 - (d) $\log(e^{2x+3})$