2015 International Released Exam Variations

AB/BC#7 If f is a differentiable function of x and $g(x) = x^2 + 6$, what is the derivative of

a) $f\big(g(x)\big)$

b) $f(x)g(x)$

c) $g\big(f(x)\big)$

d) $\frac{f(x)}{g(x)}$

BC#11 $\int (3^t + \pi^e)\, dt$

A student's solution is $\frac{3^{t+1}}{t+1} + \frac{\pi^{e+1}}{e+1} + C$

What is the student's misconception?

BC#26 Let g be the function defined by $g(x) = \int_{-2}^{x} (t^3 + 4t^2 - 12t)\, dt$. On what interval is g decreasing?

AB#23 Write the equation for the line tangent to the graph of $y = 5 + \int_1^{x^2} e^{-t^4}\, dt$ at the point where $x = -1$.