Problem 3: [24 marks]

1. [8 marks] For the given pair of functions, mark all the correct statements regarding their asymptotic behaviour.

   (a) $f_1(n) = n^2 log(n); g_1(n) = n^2 log(n^2 + n + c)$

   (b) $f_2(b) = (n)^{\sqrt{n}}; g_2(n) = (\sqrt{n})^n$

   (c) $f_3(b) = e^n; g_3(n) = n^n$

   (d) $f_4(b) = 2^n; g_4(n) = factorial(n)$

Statemnt	$f_1(n)$,$g_1(n)$	$f_2(n)$,$g_2(n)$	$f_3(n)$,$g_3(n)$	$f_4(n)$,$g_4(n)$
f(n) = big-O(g(n))	✓	✓	✓	✓
g(n) = big-O(f(n))	✓			
f(n) = Θ(g(n))	✓			
f(n) = small-o(g(n))	✓	✓	✓	✓
f(n) = big-Ω(g(n))	✓			
g(n) = snall-ω(f(n))		✓	✓	✓