Class 4: Problems on Beta and Gamma functions :

1. Show that $\int_0^\infty \frac{x^4}{4^x}dx = \frac{24}{(log\ 4)^5}$
2. Prove that $\int_0^\infty \frac{x^{m-1}}{(a+bx)^{m+n}}dx = \frac{1}{a^m b^n}\beta(m,n)$
3. Evaluate $\int_a^\infty e^{2ax-x^2}dx$ using beta function. Ans: $e^{a^2}\frac{\sqrt{\pi}}{2}$

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