Problem Sheet 5

Deadline: **Monday 14 November, 5:00**.
Hand in to **the drop box** in the undergraduate common room (maths department, room 502).

Hand in the questions marked with an asterisk (*).

One mark will be deducted if you do not **staple your work**.

1) Find the following:

a) $\int 5(x+3)^4 \, dx$ (Hint: Let $u = x + 3$)

* b) $\int 4(x + \sin x)^3 (1 + \cos x) \, dx$ (Hint: Let $u = x + \sin x$)

c) $\int \tan x \, dx$ (Hint: Write $\tan x$ as $\frac{\sin x}{\cos x}$ and let $u = \cos x$)

* d) $\int e^{x+e^x} \, dx$ (Hint: Let $u = e^x$)

c) $\int 2e^{4x^2+1} \, dx$

f) $\int (\sin x + \cos x)^2 (\cos x - \sin x) \, dx$

* g) $\int (10x - 8)^5 \, dx$

* h) $\int x \sin(x^2 + 5) \, dx$

i) $\int \frac{3x^2 - 2x}{x^3 - x^2} \, dx$

* j) $\int \frac{\sec^2 x}{\tan x} \, dx$

* k) $\int \frac{x^5 + x^2 - 1}{x^6 + 2x^3 - 6x} \, dx$

l) $\int \frac{3(\ln x)^2}{x} \, dx$

* m) $\int \frac{x}{1 - x^2} + \cos(4x + 1) \, dx$

* n) $\int xe^{x^2} - \frac{e^{2x} - e^{-2x}}{(e^x + e^{-x})^2} \, dx$