Challenge Problems:

Compute

2) $\int (12x^2+8)(x^3+2x)^6\,dx$ $= \int 4(3x^2+2)(x^3+2x)^6\,dx$

$u = x^3+2x$

$du = (3x^2+2)\,dx$

$= \int 4\,(x^3+2x)^6\,(3x^2+2)\,dx$

$= \int 4u^6\,du = \frac{4u^7}{7} + C$

$= \frac{4}{7}(x^3+2x)^7 + C$