

St. Andrew's and St. Bride's High School
Advanced Higher Homework 2

1. Differentiate with respect to x (simplifying the answers fully):

(a) $(4x^3 + 7x - 1)^5$

(b) $\cos^4 3x$

(c) $(x + 2)^{4/3}(x - 3)^{5/3}$

(d) $(3x + 4)^{9/5}(2x - 5)^{3/5}$

(e) $\frac{(5x + 4)^3}{(2x - 1)^2}$

(f) $x^5 \sin 5x$

(g) $\operatorname{cosec}(7x^2)$

(h) $\tan^3 2x$

(i) $\frac{\cos x}{1 - \sin x}$

(j) $\frac{\sin^4 x}{\cos 4x}$