Exercise 1

Find the derivative of each of these.

1 $y = \tan x + 3$
2 $y = \sin x - \csc x$
3 $y = \sin x + 6x^2$
4 $y = 5 \cos x$
5 $y = 7 \cot x$
6 $y = -3 \sec x$
7 $y = 9x^2 - 4 \cos x$
8 $y = 7x - 5 \sin x - \sec x$

Exercise 2

Differentiate the following:

1 $f(x) = (x + 4)^2$
2 $f(x) = (2x + 3)^2$
3 $f(x) = (3x - 4)^2$
4 $f(x) = (5x - 2)^4$
5 $f(x) = (5 - x)^3$
6 $f(x) = (7 - 2x)^4$
7 $y = (9 - 4x)^5$
8 $y = 4(2x + 3)^6$
9 $y = (3x + 8)^{\frac{1}{7}}$
10 $y = (2x - 9)^{\frac{5}{3}}$
11 $y = \sqrt[3]{6x - 5}$
12 $y = \dfrac{1}{\sqrt{3x - 2}}$
13 $f(x) = \dfrac{4}{5x - 4}$
14 $f(x) = \dfrac{7}{3 - 8x}$
15 $P = \dfrac{3}{(4 - 3k)^2}$
16 $N = \dfrac{5}{\sqrt{(8 - 5p)^3}}$
17 $y = \sin 4x$
18 $y = \cos 3x$
19 $y = -\sin\dfrac{1}{2}x$
20 $y = \tan 6x$
21 $y = \sec 9x$
22 $y = 6x + \cot 3x$
23 $y = \csc 2x + (3x + 2)^4$
24 $y = \sin 5x - \dfrac{4}{\sqrt{(3x + 4)^5}}$
25 $y = \sin^3 x$
26 $y = \tan^2(4x)$
27 $y = 3x^4 - \cos^3 x$
28 $y = \dfrac{2}{(3x - 4)^5} - \sec^2(2x)$
29 $y = \cos\left(3x - \dfrac{\pi}{4}\right)$
30 $y = \tan(\sqrt{x + 1})$

Review exercise

1 Differentiate these functions.

a $y = 5(3x - 2)^4$ **b** $f(x) = \dfrac{7}{\sqrt{(3 - 2x^2)}}$ **c** $y = 6t - \sec 3t$

6 Find the exact value of the gradient of the tangent to $y = \dfrac{1}{x \sin x}$ where $x = \dfrac{\pi}{4}$.

14 Consider the function $f(t) = 3 \sec 2t + 5t$.

a Find $f'(t)$.

b Find the **exact** values of

i $f(\pi)$

ii $f'(\pi)$.

[IB Nov 03 P1 Q8]