

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 $y = (3x + 8)^{\frac{1}{2}}$

10 $y = (2x - 9)^{\frac{2}{3}}$

11 $y = \sqrt[3]{6x - 5}$

12 $y = \frac{1}{\sqrt{3x - 2}}$

13 $f(x) = \frac{4}{5x - 4}$

14 $f(x) = \frac{7}{3 - 8x}$

15 $P = \frac{3}{(4 - 3k)^2}$

16 $N = \frac{5}{\sqrt{(8 - 5\rho)^3}}$

17 $y = \sin 4x$

18 $y = \cos 3x$

19 $y = -\sin \frac{1}{2}x$

20 $y = \tan 6x$

21 $y = \sec 9x$

22 $y = 6x + \cot 3x$

23 $y = \csc 2x + (3x + 2)^4$

24 $y = \sin 5x - \frac{4}{\sqrt{(3x + 4)^5}}$

25 $y = \sin^3 x$

26 $y = \tan^2(4x)$

27 $y = 3x^4 - \cos^3 x$

28 $y = \frac{2}{(3x - 4)^5} - \sec^2(2x)$

29 $y = \cos\left(3x - \frac{\pi}{4}\right)$

30 $y = \tan(\sqrt{x + 1})$

Review exercise



1 Differentiate these functions.

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



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



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]