

**1** Find the function  $f'(x)$  where  $f(x)$  is

**a**  $\sin 3x$

**b**  $\cos 4x$

**c**  $\tan 5x$

**d**  $\sec 7x$

**e**  $\operatorname{cosec} 2x$

**f**  $\cot 3x$

**g**  $\sin \frac{2x}{5}$

**h**  $\cos \frac{3x}{7}$

**i**  $\tan \frac{2x}{5}$

**j**  $\operatorname{cosec} \frac{x}{2}$

**k**  $\cot \frac{1}{3}x$

**l**  $\sec \frac{3x}{2}$

**2** Find the function  $f'(x)$  where  $f(x)$  is

**a**  $\sin^2 x$

**b**  $\cos^3 x$

**c**  $\tan^4 x$

**d**  $(\sec x)^{\frac{1}{2}}$

**e**  $\sqrt{\cot x}$

**f**  $\operatorname{cosec}^2 x$

**g**  $\sin^3 x$

**h**  $\cos^4 x$

**i**  $\tan^2 x$

**j**  $\sec^3 x$

**k**  $\cot^3 x$

**l**  $\operatorname{cosec}^4 x$

**3** Find the function  $f'(x)$  where  $f(x)$  is

**a**  $x \cos x$

**b**  $x^2 \sec 3x$

**c**  $\frac{\tan 2x}{x}$

**d**  $\sin^3 x \cos x$

**e**  $\frac{x^2}{\tan x}$

**f**  $\frac{1 + \sin x}{\cos x}$

**g**  $e^{2x} \cos x$

**h**  $e^x \sec 3x$

**i**  $\frac{\sin 3x}{e^x}$

**j**  $e^x \sin^2 x$

**k**  $\frac{\ln x}{\tan x}$

**l**  $\frac{e^{\sin x}}{\cos x}$

### Exercise 8j

- 1**
- |   |   |
|---|---|
| <b>a</b> $3 \cos 3x$  | <b>b</b> $-4 \sin 4x$   |
| <b>c</b> $5 \sec^2 5x$                                      | <b>d</b> $7 \sec 7x \tan 7x$  |
| <b>e</b> $-2 \operatorname{cosec} 2x \cot 2x$               | <b>f</b> $-3 \operatorname{cosec}^2 3x$                                   |
| <b>g</b> $\frac{2}{5} \cos \frac{2}{5}x$                    | <b>h</b> $-\frac{3}{7} \sin \frac{3}{7}x$                                 |
| <b>i</b> $\frac{2}{5} \sec^2 \frac{2}{5}x$                  | <b>j</b> $-\frac{1}{2} \operatorname{cosec} \frac{x}{2} \cot \frac{x}{2}$ |
| <b>k</b> $-\frac{1}{3} \operatorname{cosec}^2 \frac{1}{3}x$ | <b>l</b> $\frac{3}{2} \sec \frac{3}{2}x \tan \frac{3}{2}x$                |
- 2**
- |  |  |
|--|--|
| <b>a</b> $2 \sin x \cos x$   | <b>b</b> $-3 \cos^2 x \sin x$                        |
| <b>c</b> $4 \tan^3 x \sec^2 x$   | <b>d</b> $\frac{1}{2} (\sec x)^{\frac{1}{2}} \tan x$ |
| <b>e</b> $-\frac{1}{2} (\cot x)^{-\frac{1}{2}} \operatorname{cosec}^2 x$ | <b>f</b> $-2 \operatorname{cosec}^2 x \cot x$        |
| <b>g</b> $3 \sin^2 x \cos x$   | <b>h</b> $-4 \cos^3 x \sin x$                        |
| <b>i</b> $2 \tan x \sec^2 x$   | <b>j</b> $3 \sec^3 x \tan x$                         |
| <b>k</b> $-3 \cot^2 x \operatorname{cosec}^2 x$                          | <b>l</b> $-4 \operatorname{cosec}^4 x \cot x$        |
- 3**
- |   |  |
|---|--|
| <b>a</b> $-x \sin x + \cos x$                           |  |
| <b>b</b> $2x \sec 3x + 3x^2 \sec 3x \tan 3x$            |  |
| <b>c</b> $\frac{2x \sec^2 2x - \tan 2x}{x^2}$           | <b>d</b> $3 \sin^2 x \cos^2 x - \sin^4 x$                  |
| <b>e</b> $\frac{2x \tan x - x^2 \sec^2 x}{\tan^2 x}$    | <b>f</b> $\frac{1 + \sin x}{\cos^2 x}$                     |
| <b>g</b> $e^{2x} (2 \cos x - \sin x)$                   | <b>h</b> $e^x \sec 3x (1 + 3 \tan 3x)$                     |
| <b>i</b> $\frac{3 \cos 3x - \sin 3x}{e^x}$              | <b>j</b> $e^x \sin x (\sin x + 2 \cos x)$                  |
| <b>k</b> $\frac{\tan x - x \sec^2 x \ln x}{x \tan^2 x}$ | <b>l</b> $\frac{e^{\sin x} (\cos^2 x + \sin x)}{\cos^2 x}$ |