

# DIFFERENTIATION OF TRIGONOMETRIC FUNCTIONS

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A STAR MATHS ([www.astarmaths.com.au](http://www.astarmaths.com.au))

1.  $f(x) = \sin 4x$   
 $f\left(\frac{\pi}{2}\right)' = ?$

2.  $\frac{d}{dx}(\cos x - \sin x) = ?$

3.  $f(x) = \cos^2 x$   
 $f'(x) = ?$

4.  $\frac{d}{dx}(\cos(\sin x)) = ?$

5.  $\frac{d}{dx}(\sin^2 2x) = ?$

6.  $f(x) = \sin^2 x \cos x$   
 $f'\left(\frac{\pi}{2}\right) = ?$

7.  $\frac{d}{dx}(\cos x) - \frac{d^2}{dx^2}(\cos x) = ?$

8.  $f(x) = \cos^2 4x - \sin^2 4x$   
 $f'\left(\frac{\pi}{16}\right) = ?$

9.  $f(2x - 3) = \sin(mx)$   
 $f'(-3) = 2$   
Find  $m$ .

10.  $f(x) = \tan^2 x$   
 $f'\left(\frac{\pi}{3}\right) = ?$

11.  $f(x) = \tan^{-1}(2x)$   
 $f'(-1) = ?$

12.  $f(x) = \tan^{-1}(\cos x)$   
 $\sin \alpha = 1/2$   
 $f'(\alpha) = ?$

13.  $f(x) = \sin^2 \sqrt{x}$   
 $f'(x) = ?$

14.  $f(x) = \frac{x \sin x}{1 + \tan x}$   
 $f'\left(\frac{\pi}{4}\right) = ?$

15.  $f(x) = \frac{1 - \cos 2x}{1 + \cos 2x}$   
 $f'\left(\frac{\pi}{3}\right) = ?$

## ANSWERS

1. 4
2.  $-\sin x - \cos x$
3.  $-\sin 2x$
4.  $-\cos x \sin(\sin x)$
5.  $2\sin 4x$
6. -1
7.  $-\sin x + \cos x$
8. -8
9. 4
10.  $8\sqrt{3}$
11.  $2/5$
12.  $-2/7$
13.  $\frac{1}{2\sqrt{x}} \sin 2\sqrt{x}$
14.  $\sqrt{2}/4$
15.  $8\sqrt{3}$

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