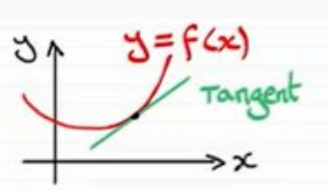




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Calculus - What is dy/dx ? | Differentiation and overview



$y=f(x)$
Tangent

$\frac{dy}{dx}$ is a measure of rate of change (often called the gradient function) it gives the gradient of the tangent at any point x on the curve $y=f(x)$

For terms of the form $y=ax^n$

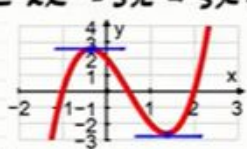
The gradient is given by this formula

$$\frac{dy}{dx} = anx^{n-1}$$

$y=ax$
 $\frac{dy}{dx} = a$

$y=a$
 $\frac{dy}{dx} = 0$

$y=(2x-1)(x-2)(x+1)$
 $= (2x-1)(x^2-x-2)$
 $= 2x^3 - 3x^2 - 3x + 2$




$\therefore \frac{dy}{dx} = 6x^2 - 6x - 3$

x	-1	0	1	2	3
$\frac{dy}{dx}$	9	-3	-3	9	33

For stationary points
 $\frac{dy}{dx} = 0 \therefore 6x^2 - 6x - 3 = 0$
 $x = -0.37, 1.37$ (2 dp)

$y = \frac{2}{3}\sqrt{x} - \frac{4x-1}{3x^2}$
 $= \frac{2}{3}x^{1/2} - \frac{1}{3}x^{-2}(4x-1)$
 $= \frac{2}{3}x^{1/2} - \frac{4}{3}x^{-1} + \frac{1}{3}x^{-2}$

$\therefore \frac{dy}{dx} = \frac{1}{3}x^{-1/2} + \frac{4}{3}x^{-2} - \frac{2}{3}x^{-3}$
 $= \frac{1}{3x^{1/2}} + \frac{4}{3x^2} - \frac{2}{3x^3}$



stationary point

$\frac{dy}{dx} = 0$ at $x = 0.46$ (2dp)

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