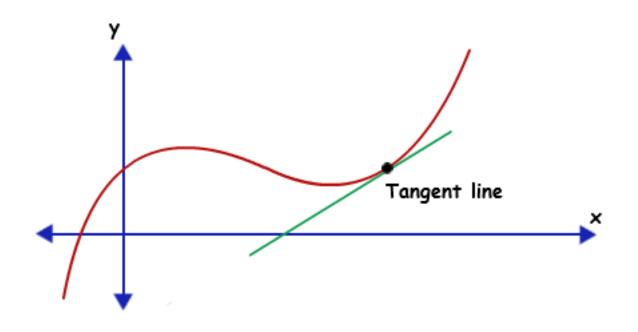


#### Equation of tangent and normal

Meaning of derivative  $y', \frac{dy}{dx}, f'(x)$ 

# Slope of the curve Slope of the tangent line



Two steps to find the equation of straight line

$$y = mx + c$$

Slope (m)
point (x, y)

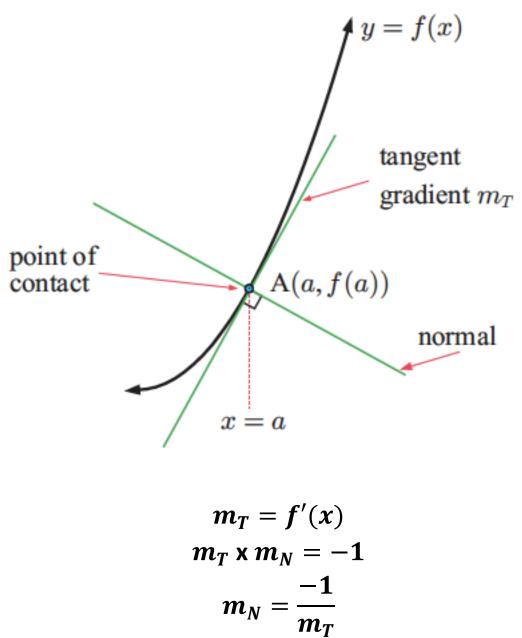


1. Find the equation of the tangent to  $f(x) = 2x^2 + 5$  at the point where x = 2.

2. Find the equation of the tangent to  $f(x) = x^3 - 4x$  at (1, -3).



### **Equation of normal**





1. Find the equation of the normal to  $f(x) = 2x^2 - 10$  at the point where x = -1.

2. Find the equation of the normal to  $f(x) = \ln \sqrt{x} + 5$  at the point where x = 2.

# Paper 1



1. In Let  $f(x) = e^{2x}$ . The line L is the tangent to the curve of fat (1,  $e^2$ ).

Find the equation of L in the form y = ax + b.





2. Let  $f(x) = kx^4$ . The point P(1, k) lies on the curve of f. At P, the normal to the curve is parallel to  $y = -\frac{1}{8}x$ . Find the value of k.

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# Paper 2



1. 
$$f(x) = \frac{\ln (4x)}{x}$$
, for  $0 \le x \le 5$ .

Point P(0.25, 0) and Q are on the curve of f. The tangent to the curve of f at P is perpendicular to the tangent at Q. Find the coordinates of Q.





2. Let 
$$f(x) = \frac{g(x)}{h(x)}$$
, where  $g(2) = 18$ ,  $h(2) = 6$ ,  $g'(2) = 5$ 

and h'(2) = 2. Find the equation of the normal to the graph of f at x = 2.