

Tangent *and* Normal Lines

Find the gradient function of $f(x) = x^2 - \frac{4}{\sqrt{x}}$.

Hence find the gradient of the tangent to $f(x)$ at the point where $x = 4$.

- * A tangent to a curve is a line that _____ the curve without _____ over.
 - * A normal to a curve is a line that is _____ to the tangent line.
 - * When lines are perpendicular, the slopes are _____
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Find the slope of the tangent line at $x = 1$.

Find the equation of the tangent line.



Find the slope of the normal line at $x = 1$.

Find the equation of the normal line.

The function $f(x) = 3x^2 - 2$ is given.

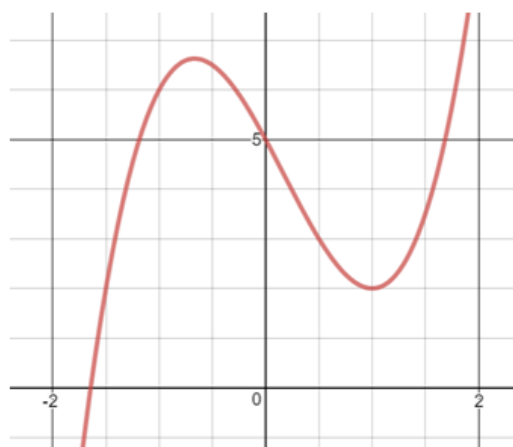
Find:

- a the derivative of the function at $x = 1$
- b the equation of the tangent to the curve at $x = 1$
- c the equation of the normal to the curve at $x = 1$

Shown is a graph of
 $f(x) = 2x^3 - x^2 - 4x + 5$

Find the gradient
at $x = 0.5$

Then, find the equation
of the tangent line at
that point.



Confirm on the graph...

Find the coordinates of the points on the graph of $f(x) = \frac{1}{3}x^3 - \frac{1}{2}x^2 - 8x + 7$ where the gradient is 4.

Find the equation(s) of any horizontal tangents to the curve $y = 2x^3 + 3x^2 - 12x + 1$.