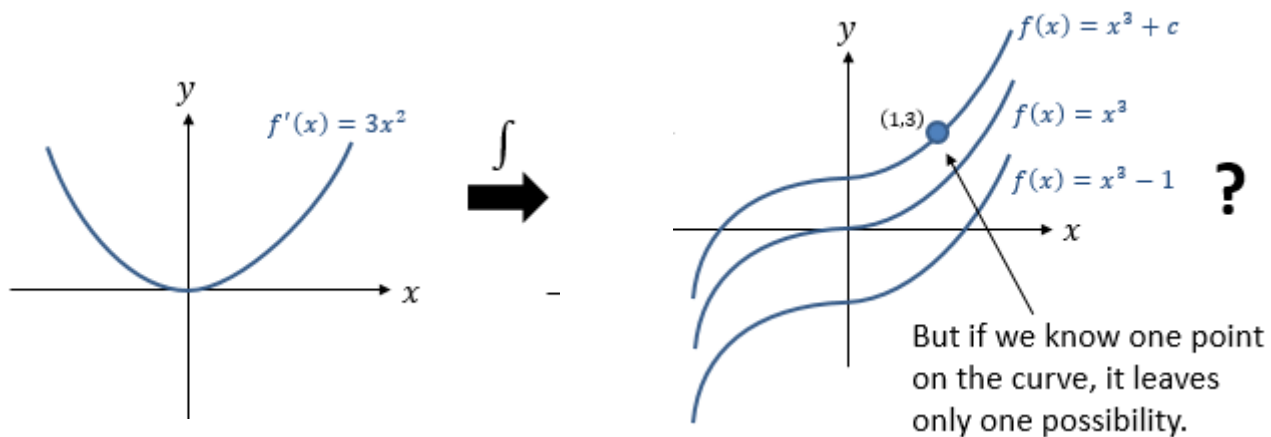# Finding the Constant of Integration

Recall that when we integrate, we get a constant of integration, which could be any real value. This means **we don't know what the exact original function was**.

But if we know one point on the curve, it leaves only one possibility.

Example

The curve with equation $y = f(x)$ passes through $(1,3)$. Given that $f'(x) = 3x^2$, find the equation of the curve.

A curve with equation $y = f(x)$ passes through the point $(4, 25)$.

Given that

$$f'(x) = \frac{3}{8}x^2 - 10x^{-\frac{1}{2}} + 1, \qquad x > 0$$

(a) find $f(x)$, simplifying each term.

(5)

(b) Find an equation of the normal to the curve at the point $(4, 25)$.

Give your answer in the form $ax + by + c = 0$, where a, b and c are integers to be found.

(5)

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