Answer on Question #67603 – Math – Calculus

Question

The gradient of the tangent drawn at any point on a curve is given by

m= dy/dx =1 -4x.

Determine the equation of the curve if it passes through point (-2,4).

Solution

Let's integrate dy/dx to find the function of the curve that satisfies the given differential equation everywhere:

$y = \int(1 - 4x)dx = x - 2x^2 + C,$

so

$$y = x - 2x^2 + C$$

Let's put the coordinates $x = -2;\ \ y = 4$ of point (-2,4) in the previous formula and find *C*:

$$4 = -2 - 2(-2)^2 + C = -2 - 2 * 4 + C$$

$$C = 4 + 10 = 14$$

Thus,

$$y = x - 2x^2 + 14$$

Answer:

The equation of the curve is $y = -2x^2 + \mathrm{x} + 14$