

Differential Equations

1. $f'(x) = 6x^2 - 4x$. Given $f(2) = 10$ find a formula for $f(x)$.
2. $f'(x) = 10x - 2x^3$. Given $f(2) = 0$ find a formula for $f(x)$.
3. $\frac{dy}{dx} = 3 + 6x - x^2$. When $x = 3$, $y = 10$. Find a formula for y .
4. $\frac{dy}{dx} = 6x - \frac{5}{x^2}$. Find a formula for the curve y given it passes through the point $(1,6)$.
5. $\frac{dy}{dx} = 3\sqrt{x} - 6x$. Find a formula for y given the curve passes through $(4,-30)$.
6. The gradient of the tangent to a curve is given by $f'(x) = 6x^2 - 4$. If the curve passes through the point $(2,7)$, find its equation.
7. The gradient of the tangent to a curve is given by $\frac{dy}{dx} = \frac{2}{\sqrt{x}} + 1$. If the curve passes through the point $(9,10)$, find its equation.
8. $f'(x) = 3x^2 - 4x + 6$ and $f(2) = 17$.
Find a formula for $f(x)$.
9. $f'(x) = \frac{2x^3 - x^2}{x}$ and $f(6) = 100$.
Find a formula for $f(x)$.
10. $f'(x) = 4x(x^2 - 1)$ and $f(-1) = 2$. Find a formula for $f(x)$.
11. The graph of $y = g(x)$ passes through the point $(3,-1)$.
If $\frac{dy}{dx} = 3x^2 - \frac{1}{x^2}$, express y in terms of x .
12. The graphs of $y = f(x)$ and $y = g(x)$ intersect at the point A on the y -axis.
If $g(x) = 4x + 2$ and $f'(x) = 2x - 6$,
find $f(x)$.



