

Do you remember your rules of differentiation?

1. Find y' for the following:

(a) $y = 4x^3 - 7x^2 + 19$

(b) $y = \sqrt{x} - \frac{2}{x^3} + e^x$

(c) $y = (x^2 + 5)^3$

(d) $y = \sin^5 x$

(e) $y = xe^x$

(f) $y = \cos^4(x^2)$

2. Now try to go backwards. Find y given the y' . Make your best guess and check your answer.

(a) $y' = 7x^4 + 5x + 2$

(b) $y' = 3\sqrt{x} + \frac{4}{x^2} - e^x$

(c) $y' = 12x^2(x^3 + 7)^3$

(d) $y' = 4 \sin^3 x \cos x$

(e) (tricky) $y' = xe^x$

(f) $y' = 6x \cos^2(x^2) \sin(x^2)$

3. Find the position function $s(t)$ if the acceleration is $a(t) = 3$, the initial velocity is $v(0) = 2$ and the initial position is $s(0) = 1$.