

Task Solutions

1. $f(x) = 7x^4$

► $f'(x) = 4 * 7x^3 = 28x^3$ (Exponentiation Rule)

2. $g(x) = 2x^4 + 3x^3 + x^2 + 10x + 5$

► $g'(x) = 8x^3 + 9x^2 + 2x + 10$ (Exponentiation Rule)

3. $h(x) = 4e^{3x}$

► Chain Rule: Outer function $k(x) = 4e^x$ and inner function $l(x) = 3x$

► $k'(x) = 4e^x$ and $l'(x) = 3 \Rightarrow h'(x) = 4e^{3x} * 3 = 12e^{3x}$

4. $i(x) = (12x^2 + 5)3x^3$

► $i'(x) = 24x * 3x^3 + (12x^2 + 5) * 9x^2$ (Multiplication Rule)

► $i'(x) = 72x^4 + 108x^4 + 45x^2 = 180x^4 + 45x^2$

5. $j(x) = \frac{3x}{\cos(x)}$

► $j'(x) = \frac{3 * \cos x - 3x * -\sin x}{\cos^2 x}$ (Division Rule)