PRODUCT RULE

Product Rule is applied to differentiate two terms that are multiplied to each other. Sometimes you may need to apply product rule in quotient rule or sum rule, hence why it is important to understand these too.

USE PRODUCT RULE TO DIFFERENTIATE

$$f' = g'(x)h(x) + h'(x)g(x)$$

Similar process to quotient rule, one needs to identify what the two terms are that have been multiplied together, once doing this, they simply differentiate both terms and plug them into the equation based on general form.

$$f(x) = (7x^6)(8x^4)$$
$$g'(x) = 42x^5$$
$$h'(x) = 32x^3$$

To do this, one would simply apply power rule to differentiate as shown by bringing the exponent down to the co-efficient to find the product of those two numbers, before subtracting one from the exponent.

Then, the first term differentiated is then multiplied by the second term as is, before a sum operation, after this, the derivative of the second term is then multiplied by the first term as is. Hence, one achieves the following result.

$$f(x) = 42x^5(8x^4) + 7x^6(32x^3)$$

Again, when you are differentiating, you may need to work with surds and fractions in order to complete the process, it is important to perform these simple arithmetic operations correctly in order to find the correct answer.