✓

1.

1 / 1 points

In the following quiz, you will practice how to use the product rule. Some questions look tricky, but just stick to the rules you know!

What is the differential of $f(x)g(x)$?

○ $f(x)g'(x)$

○ $f'(x)g(x)$

○ $f'(x)g'(x)$

◉ $f'(x)g(x) + f(x)g'(x)$

Correct
Well done!

✓

2.

1 / 1 points

Using the product rule, differentiate with respect to x the function $f(x) = (x+2)(3x-3)$.

○ $f'(x) = 3x + 3$

◉ $f'(x) = 6x + 3$

Correct
Well done! You can verify this by expanding out $(x+2)(3x-3)$ and then differentiating the quadratic.

○ $f'(x) = 3x + 6$

○ $f'(x) = 3$

✓

3.

1 / 1 points

Using the product rule, differentiate with respect to x the function $f(x) = e^x(x^2 + 7x - 3 - sin(x))$.

○ $f'(x) = xe^{x-1}(x^2 + 7x - 3 + cos(x))$

◉ $f'(x) = e^x(x^2 + 9x + 4 - sin(x) - cos(x))$

Correct
Well done!

○ $f'(x) = e^x(2x + 7 - cos(x))$

○ $f'(x) = xe^{x-1}(x^2 + 7x - 3) + e^x(2x + 7) - cos(x)$

✓

4.

1 / 1 points

Using the product rule, differentiate with respect to x the function $f(x) = (x^2 - 2x + 5)(sin(x) + cos(x))$.

◉ $f'(x) = (x^2 + 3)cos(x) - (x^2 - 4x + 7)sin(x)$

Correct
Well done!

○ $f'(x) = (x^2 + 3)sin(x) + (x^2 - 4x + 7)cos(x)$

○ $f'(x) = (2x - 2)(cos(x) - sin(x))$

○ $f'(x) = (2x - 5)(cos(x) - sin(x))$

✓

5.

1 / 1 points

Using the product rule, differentiate with respect to x the function $f(x) = e^x(3x - 2)sin(x)$.

Hint: consider $f(x)g(x)h(x)$ as $[f(x)g(x)]h(x)$, and use the product rule twice.

○ $f'(x) = -3e^x cos(x)$

○ $f'(x) = e^x(3cos(x) - 2)$

○ $f'(x) = 3e^x cos(x)$

◉ $f'(x) = e^x((3x + 1)sin(x) + (3x - 2)cos(x))$

Correct
The best way is to apply the product rule twice.