Q) $f(x) = x\,\sigma(x)$

$f'(x) = \sigma(x) + x\sigma'(x)$

$= \sigma(x) + x\sigma(x)(1-\sigma(x))$ as $\sigma'(x) = \sigma(x)(1-\sigma(x))$

$= \sigma(x)[1 + x - x\sigma(x)]$

$= \sigma(x)[1 + x - f(x)]$

$= \sigma(x) + f(x) - \sigma(x) f(x)$

$= \sigma(x)(1 - f(x)) + f(x)$

↓ computationally expensive as we need to compute several multiplications involving Taylor Series terms.

$$\frac{d}{dx} \text{ReLu}(x) = \begin{cases} 1 & , x \geq 0 \\ 0 & , \text{otherwise} \end{cases}$$

→ Requires just one comparison.

```
if x >= 0:
    return 1
else:
    return 0.
```

→ O(1).