Bài 1:

a/ $\frac{\partial L}{\partial a}$

- $\frac{\partial L}{\partial L} = 1$
- $\frac{\partial L}{\partial e} = 2e$
- $\frac{\partial L}{\partial d} = \frac{\partial L}{\partial e} * \frac{\partial e}{\partial d} = 2e * 1 = 2e$
- $\frac{\partial L}{\partial c} = \frac{\partial L}{\partial d} * \frac{\partial d}{\partial c} = 2e * 1 = 2e$
- $\frac{\partial L}{\partial a} = \frac{\partial L}{\partial c} * \frac{\partial c}{\partial a} = 2e * x = 2ex$

Vậy: $\frac{\partial L}{\partial a} = 2ex$

b/ $\frac{\partial L}{\partial y}$

- $\frac{\partial L}{\partial L} = 1$
- $\frac{\partial L}{\partial e} = 2e$
- $\frac{\partial L}{\partial y} = \frac{\partial L}{\partial e} * \frac{\partial e}{\partial y} = 2e * (-1) = -2e$

Vậy: $\frac{\partial L}{\partial a} = -2e$

Bài 2:

a/ Tính S:

- a = 3
- b = 2
- c = a + b = 3 + 2 = 5
- S = c * b = 5 * 2 = 10

Vậy: S = 10

b/ Tính $\frac{\partial S}{\partial a}$:

- $\frac{\partial S}{\partial S} = 1$
- $\frac{\partial S}{\partial c} = b$
- $\frac{\partial S}{\partial a} = \frac{\partial S}{\partial c} * \frac{\partial c}{\partial a} = b * 1 = b$

Vậy $\frac{\partial L}{\partial a} = b$

c/ Tính $\frac{\partial S}{\partial b}$:

- $\frac{\partial S}{\partial S} = 1$
- $\frac{\partial S}{\partial b} = c$

Vậy $\frac{\partial S}{\partial b} = c$

Bài 3: Cho hàm $f(x) = x^2 + 3x + 2$

a/ Tính giá trị của f(x) khi x = 5:

```
[1]  import torch

[2]  x = torch.tensor(5.0, requires_grad = True)

[8]  y = torch.pow(x, 2) + 3 * x + 2
     print(y.item())

     42.0
```

b/ Tính $\frac{\partial y}{\partial x}$ khi x = 13:

```
[1]  import torch

[17] x = torch.tensor(13.0, requires_grad = True)

[18] y = pow(x, 2) + 3*x + 2

[19] y.backward(retain_graph = True)
     print(x.grad)

     tensor(29.)
```