

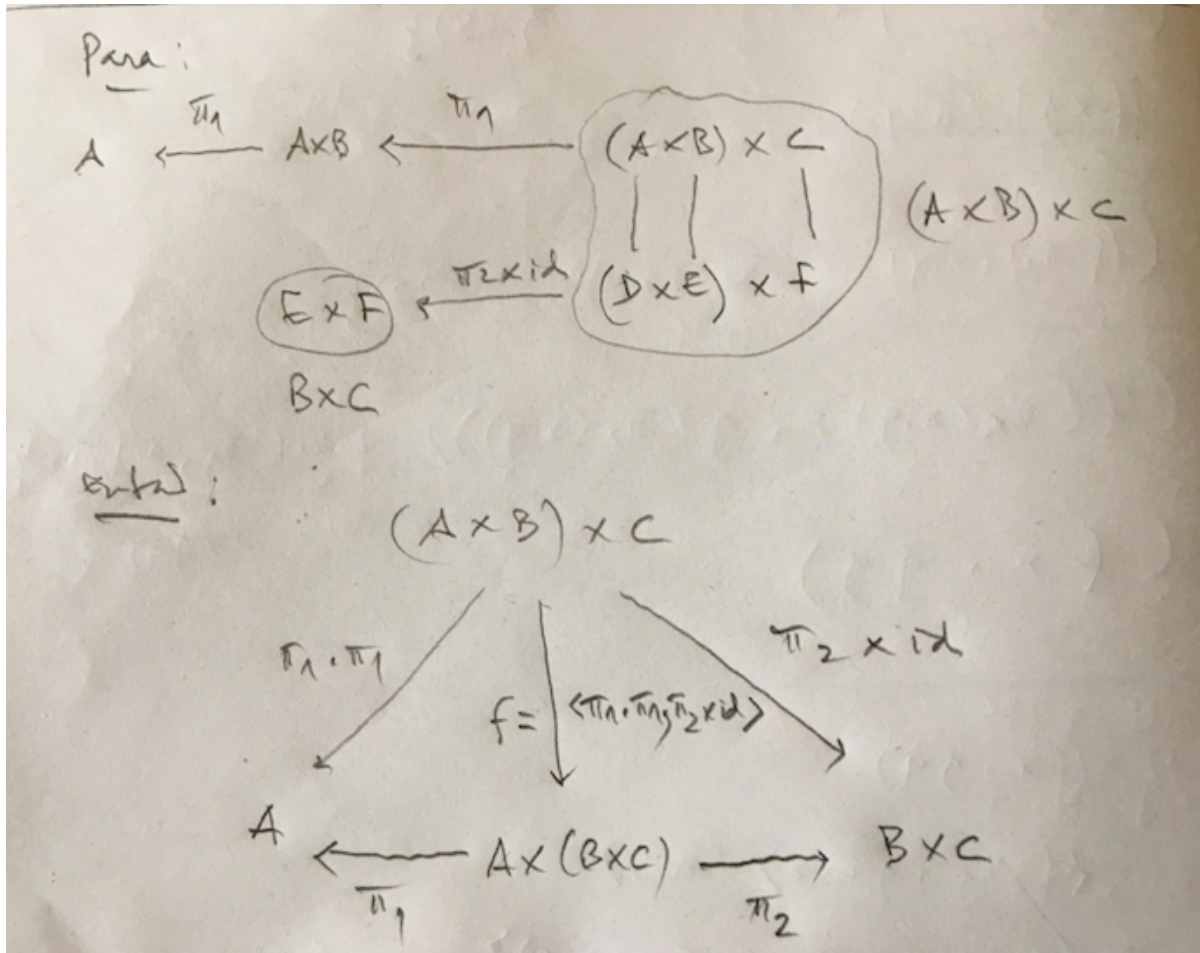
4. Considere as funções seguintes:

$$f = \langle \pi_1 \cdot \pi_1, \pi_2 \times id \rangle$$

$$g = \langle id \times \pi_1, \pi_2 \cdot \pi_2 \rangle$$

Identifique os tipos de f e g . Acompanhe a sua resolução com a construção dos respectivos diagramas.

Resolução



```
In [1]: f = split (p1 . p1) (p2 >> id) where
        p1 = fst
        p2 = snd
        split f g x = (f x, g x)
        (f >> g) (a,b) = (f a, g b)

        --- type checking

:t f
```

f :: forall a1 a2 b. ((a1, a2), b) -> (a1, (a2, b))

```
In [2]: g = split (id >> p1) (p2 . p2) where
        p1 = fst
        p2 = snd
        split f g x = (f x, g x)
        (>>) f g (a,b) = (f a, g b)

        --- type checking

:t g
```

```
g :: forall a1 a2 b. (a1, (a2, b)) -> ((a1, a2), b)
```

In [5]:

```
( f . g ) (1,(2,3))
```

```
(1,(2,3))
```