Question 1:

The coefficients should all be correct (to the nearest 0.1):

- petal_width as a function of petal_length: 0.942
- sepal_width as a function of petal_width: -0.248

Question 2:

For petal_width as a function of petal_length, the linear correlation coefficient is **greater than** (in absolute value) to sepal_width as a function of petal_width.

The larger coefficient is graphically represented by points clustered tightly around a straight line (in fact, they are almost aligned). The smaller coefficient has points that are more dispersed.

Note: the coefficient -0.248 indicates a slight linearity between sepal_width and petal_length when we take the **whole sample** into account. When we separate the sample by **species**, the linearity between these two variables is stronger. This is a **tri-variate** analysis because we study the relationship between three variables: species, sepal_width, and petal_length.

Question 3:

This response is considered correct if:

1. Coefficients a and b of case 1 are correct (to the nearest 0.1)

OR

2. The 6 coefficients a and b of cases 2, 3, and 4 are correct (to the nearest 0.1)

Here are the coefficients:

case 1: a=0.386 , b=0.509
case 2: a=1.788 , b=1.459
case 3: a=0.699 , b=1.038
case 4: a=0.974 , b=0.809

Question 4:

Le response is correct if the code that replaces [...] is equivalent to the following:

```python
coeffs = {
    "case 1" : {'a':0.386 , 'b':0.509},
    "case 2" : {'a':1.788 , 'b':1.459},
    "case 3" : {'a':0.699 , 'b':1.038},
    "case 4" : {'a':0.974 , 'b':0.809}
}
    if species == "setosa":
        a = coeffs["case 2"]['a']
        b = coeffs["case 2"]['b']
    elif species == "virginica":
        a = coeffs["case 3"]['a']
        b = coeffs["case 3"]['b']
    elif species == "versicolor":
        a = coeffs["case 4"]['a']
        b = coeffs["case 4"]['b']
        Y = a*X + b
        iris.loc[i,"sepal_width"] = Y
```

Note: The first 6 lines indicate the 8 coefficients. They do not necessarily have to be equal to the ones mentioned here, but they **must** be coherent with the coefficients provided by the student in question 3.