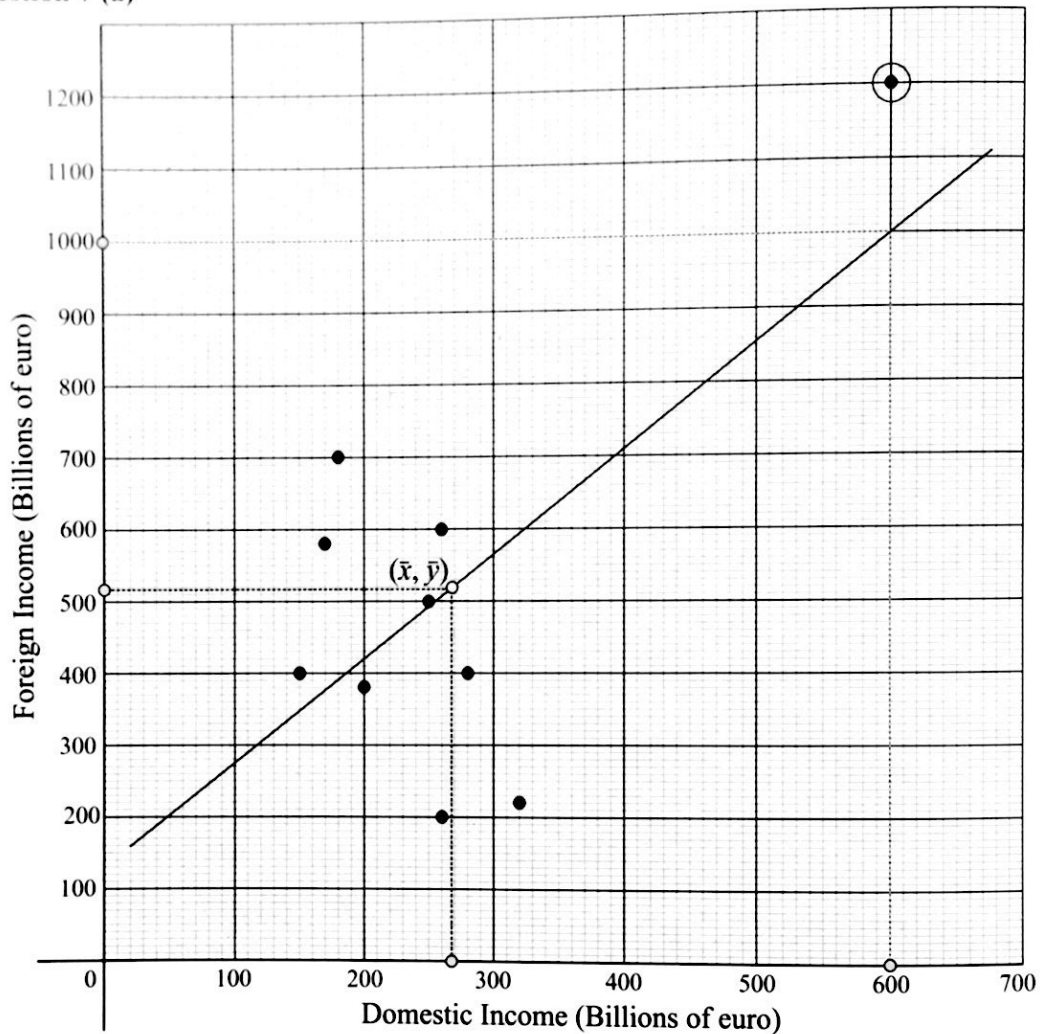


**QUESTION 7 (75 MARKS)**

**Question 7 (a)**



**Question 7 (b)**

CASIO CALCULATOR (*fx-85GT PLUS*)  
 Steps to find  $r$ :  
 Press Mode.  
 Press 2: Stat  
 Press 2:  $A + Bx$   
 Input your  $x$  and  $y$  values  
 Press AC Button  
 Press Shift followed by the Number 1  
 Press 5: Reg  
 Press 3:  $r$   
 Press =

$r = 0.6378$

**Question 7 (c)**

$$\bar{x} = \frac{150 + 170 + 180 + 200 + 250 + 260 + 280 + 320 + 600 + 260}{10} = 267$$

$$\bar{y} = \frac{400 + 580 + 700 + 380 + 500 + 200 + 400 + 220 + 1200 + 600}{10} = 518$$

$$(\bar{x}, \bar{y}) = (267, 518)$$

$$(\bar{x}, \bar{y}) = (267, 518), (x_2, y_2) = (600, 1000)$$

$$m = \frac{1000 - 518}{600 - 267} = 1.4$$

As the yearly domestic income *increases* the foreign yearly income *increases*.

**Question 7 (d)**

Outlier (600, 1200);

Possible answer: A boom for the economy due to a huge tourist influx and a huge increase in computer/pharmaceutical exports due to the exchange rate of the euro.

**Question 7 (e)**

Remove (600, 1200) from the table and input the results again into your calculator. After pressing the AC button do the following:

**Question 7 (e) (i)**

CASIO CALCULATOR (fx-85GT PLUS)  
 Press Shift followed by the Number 1  
 Press 4: Var  
 Press 2:  $\bar{x}$   
 Press = [Write down the answer]  
 Press Shift followed by the Number 1  
 Press 4: Var  
 Press 3:  $\sigma_x$   
 Press = [Write down the answer]

$$\bar{x} = 230$$

$$\sigma_x = 54$$

**Question 7 (e) (iii)**

CASIO CALCULATOR (fx-85GT PLUS)  
 Press Shift followed by the Number 1  
 Press 5: Reg  
 Press 3:  $r$   
 Press = [Write down the answer]

$$r = -0.5085$$

**Question 7 (e) (ii)**

CASIO CALCULATOR (fx-85GT PLUS)  
 Press Shift followed by the Number 1  
 Press 4: Var  
 Press 3:  $\bar{y}$   
 Press = [Write down the answer]  
 Press Shift followed by the Number 1  
 Press 4: Var  
 Press 3:  $\sigma_y$   
 Press = [Write down the answer]

$$\bar{y} = 442$$

$$\sigma_y = 160$$

**Question 7 (f) (i)**

$$y = \bar{y} + \frac{r\sigma_y}{\sigma_x}(x - \bar{x})$$

$$y = 442 + \left[ \frac{(-0.5085)160}{54} \right] (x - 230)$$

$$y = 442 - 1.51(x - 230)$$

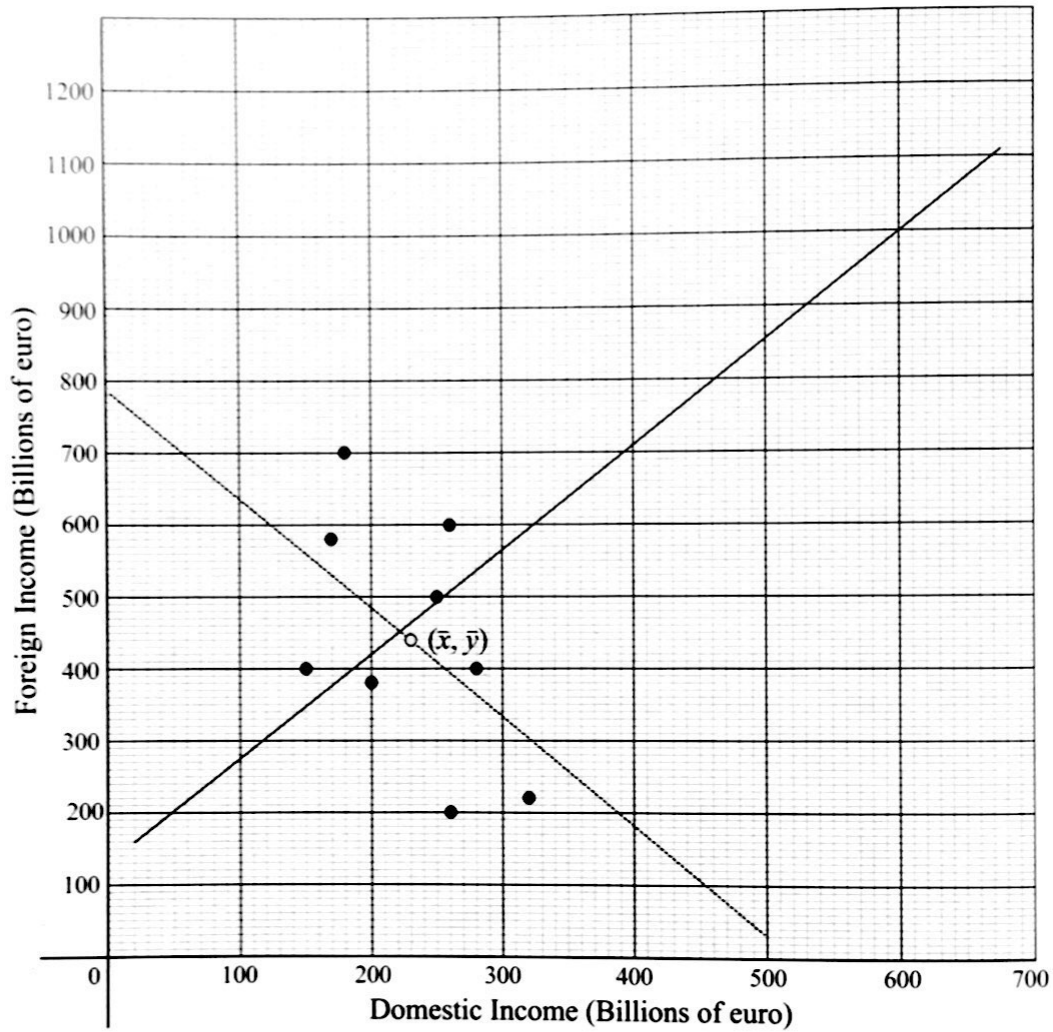
$$y = 442 - 1.51x + 347.3$$

$$y = -1.51x + 789.3$$

**Question 7 (f) (ii)**

$$\text{Slope } m = -1.5$$

**Question 7 (f) (iii)**



**Question 7 (f) (iv)**

The slope is now negative, there is a negative moderate correlation. The difference is that as domestic yearly income increases the foreign yearly income decreases.