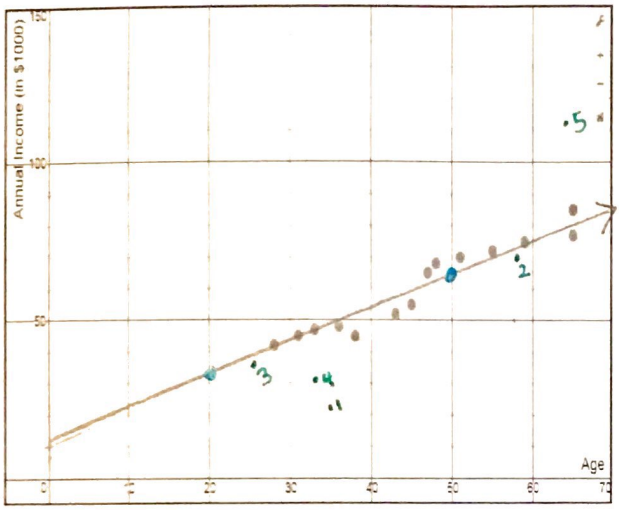
Algebra 1/2, Unit 5 Name: Taylor

Practice Work Sample: Income vs. Age

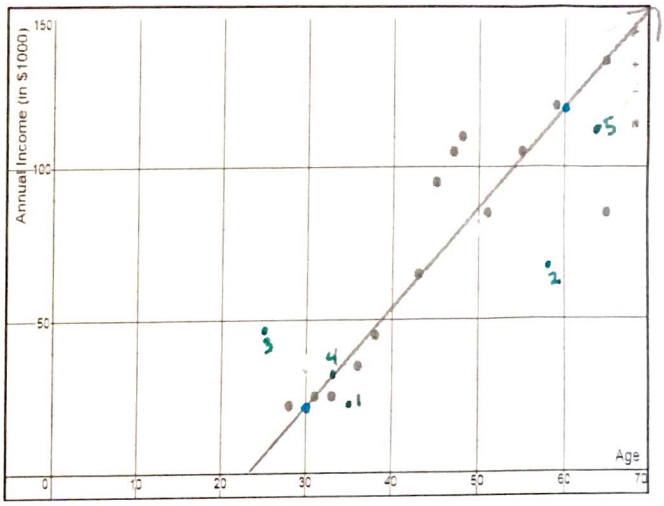
Abe is a sociologist studying income and age in two different countries. He has collected the following data:

Country A



(1)

Country B



Abe's boss gives him a challenge: The table below shows the age and income for 5 people who are either from Country A or from Country B. Use your scatter plots to determine which country each of the following 5 people are from. Include a description of how you decided the country of each person and show work to support your thinking.

Person	1	2	3	4	5
Age	35	58	25	33	64
Income	22	68	46	31	113

This problem is asking me to determine which country each person in the table is from. I will ① draw a line of best fit, then ② write an equation to represent each country. Then, ③ I will put each person's age in each country's equation to see which result is closest to their actual income.

② Country A:

slope: (20, 33) (50, 64)
x_1 y_1 x_2 y_2

$m = \frac{64-33}{50-20} = \frac{31}{30} = 1.03$

$y - 33 = 1.03(x - 20)$

$y - 33 = 1.03x - 20.6$

$+33 \quad +33$

$y = 1.03x + 12.4$

② Country B

slope: (30, 22) (60, 119)
x_1 y_1 x_2 y_2

$m = \frac{119-22}{60-30} = \frac{97}{30} = 3.2$

$y - 22 = 3.2(x - 30)$

$y - 22 = 3.2x - 96$

$+22 \quad +22$

$y = 3.2x - 74$

③

	Country A	Country B
Person 1 (35, 22)	$y = 1.03(35) + 12.4 = 48.45$	$y = 3.2(35) - 74 = \boxed{38}$ ✓ (closer to 22)
Person 2 (58, 68)	$y = 1.03(58) + 12.4 = \boxed{72.14}$ ✓ (closer to 68)	$y = 3.2(58) - 74 = 111.6$
Person 3 (25, 46)	$y = 1.03(25) + 12.4 = \boxed{38.15}$ ✓ (closer to 46)	$y = 3.2(25) - 74 = 6$
Person 4 (33, 31)	$y = 1.03(33) + 12.4 = 46.39$	$y = 3.2(33) - 74 = \boxed{31.6}$ ✓ closer to 31
Person 5 (64, 113)	$y = 1.03(64) + 12.4 = 78.32$	$y = 3.2(64) - 74 = \boxed{130.8}$ ✓ closer to 113

As seen in my calculations above, Persons 2 & 3 are from Country A, and Persons 1, 4, & 5 are from Country B. To check the reasonableness of my calculations, I plotted a point for each person on the graphs of Country A and Country B to see which Country's data points the person's point was closest to. Plotting points for each person verified my calculations above that Persons 2 & 3 are from Country A, and Persons 1, 4, & 5 are from Country B.