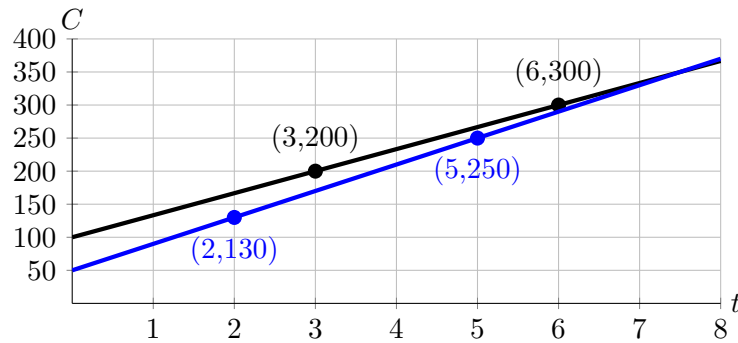**1.** [11 points] Pam the Plumber charges customers $P(t)$ dollars for a t hour visit to their house. A graph of $C = P(t)$ is shown below.

a. [2 points] Find the value of $P(0)$ and explain what it means in context.

$P(0) = $ _____**100**_____

Meaning: This is how much Pam charges to arrive at house, without having done any work yet.

b. [2 points] Find the slope of $P(t)$ and explain what it means in context.

Slope: _____100/3_____

Meaning: After her arrival cost, for every 3 hours Pam stays, she charges \$100. Or, she charges \$33.3̄ / hour.

c. [2 points] Beth the Bathtub-fixer charges \$50 for a home visit plus \$40/hour spent there. Let $B(t)$ be the amount she charges for a t hour visit. Add the graph of $C = B(t)$ for $0 \le t \le 8$ to axes above. **Clearly label at least two points on your graph with their** (t, C) **coordinates.**

Solution: See graph above.

d. [5 points] Find the coordinates of the point where the two graphs intersect and explain what this means in context. *Show all work. Give your final answer in exact form, or rounded to at least two decimal places.*

Solution: We need to find where the two linear equations intersect. To do this we can solve the following equation for t:

$$50 + 40t = 100 + 100t/3$$

By adding and subtracting terms from both sides, this simplifies to:

$$20t/3 = 50$$

which finally is equivalent to:
$$t = 150/20 = 7.5$$

To find the C-coordinate, we can plug $t = 7.5$ into either expression. In particular:

$$50 + 40 \times 7.5 = 350$$

Point $(t, C) = $ _____(7.5, 350)_____

Meaning: This means that when Pam and Beth each work 7.5 hours, they earn the same amount of money for the visit.