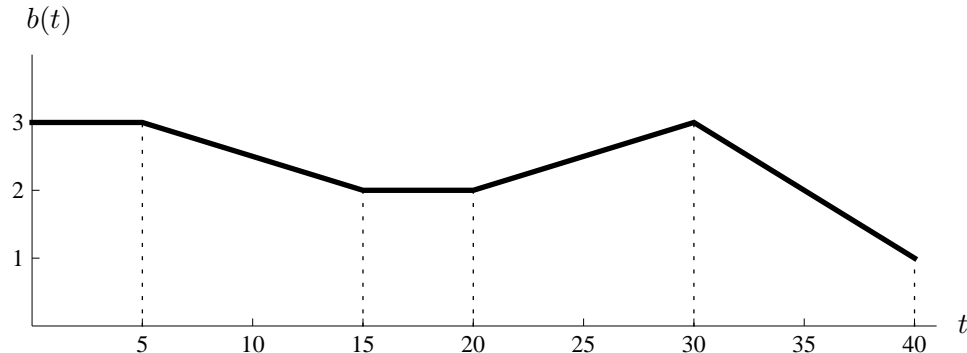


6. [11 points] During a recent practice, the UM basketball team was split up into a Maize team and Blue team. The teams played against each other for a full 40 minute game. The graph of the function  $b(t)$  below shows the Blue team's scoring rate in points per minute  $t$  minutes after the beginning of the game.



The Maize team scored 2 points per minute for the first 30 minutes of the game and then they scored 3 points per minute for the last 10 minutes.

- a. [3 points] Calculate the exact value of the integral

$$\int_5^{15} (b(t) - 2) dt.$$

*Solution:* From the picture we see that the area of the triangle between the graph and the line  $y = 2$  is 5.

- b. [3 points] Give a practical interpretation of the integral from (a) in the context of the problem.

*Solution:* Between the fifth and fifteenth minute of the game, the Blue Team's scored 5 points more than the Maize team.

- c. [3 points] Calculate the average scoring rate of the Blue team during the first half of the game. Include units in your answer.

*Solution:*

$$\frac{1}{20} \int_0^{20} b(t) dt = \frac{5}{2} \text{ points/minute}$$

- d. [2 points] What was the final score of the game? You do not need to show your work.

Blue Team's Score = 95

Maize Team's Score = 90