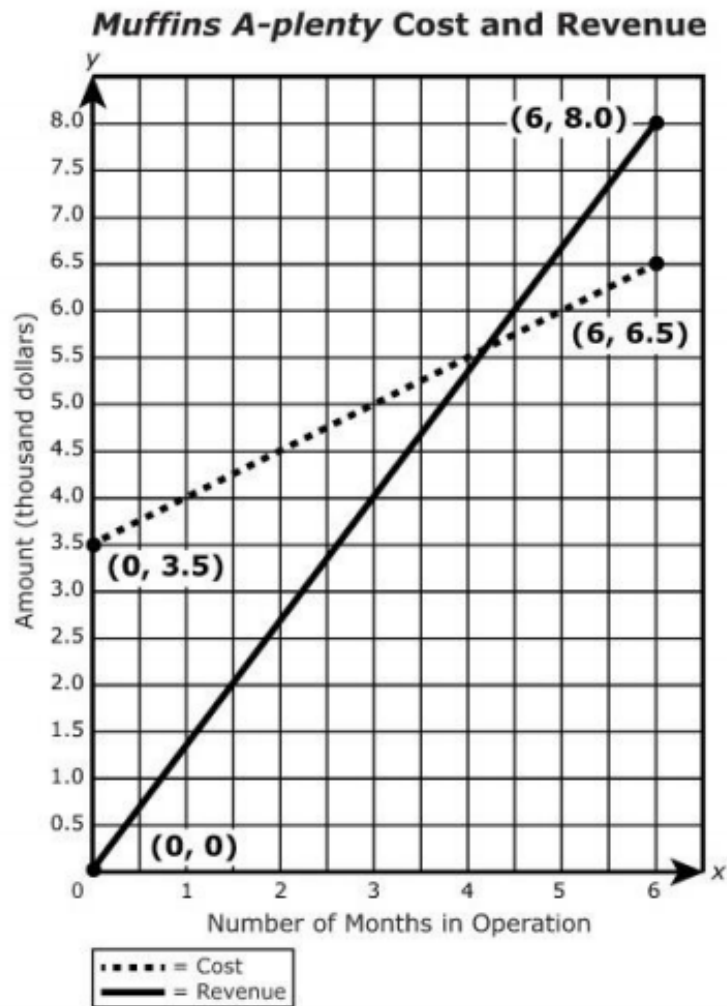


November ECR (HS.D.2.9) – Calculator is allowed

The cost of a business is the amount of money spent to start the business and keep it in operation. The revenue is the amount of money the business earns from the sale of goods or services

An online business called Muffins A-plenty started on January 1 of a recent year. The lines in the graph represent the cost function and the revenue function of the first six months that Muffins A-plenty has been in operation.



Part A

Write equations to represent the cost function and the revenue function for this business.

Enter your equations in the spaces provided. Enter **only** your equations.

Cost function: $y = \square$

Revenue function: $y = \square$

Part B

The profit of a business equals revenue minus cost. First, write an equation that represents the profit function for Muffins A-plenty using your cost and revenue functions from Part A.

Part C

Predict the profit after 10 months of operation. Round your answer to the nearest dollar. Provide valid mathematical reasoning and calculations to support your answer.

Enter your answer and your support in the space provided.

Rubric

Score	Description
2	<p>2 points 1 point for the correct equation for Cost 1 point for the correct equation for Revenue</p> <p>Part A: $\frac{1}{2}x + \frac{7}{2}$ $\frac{4}{3}x$ or equivalent expressions</p>
1	<p>Student response includes the following 2 elements.</p> <ul style="list-style-type: none"> Modeling component = 1 point for Valid equation that represents the profit function based on Part A <p>Sample Student Response:</p> <p>Profit = Revenue - Cost</p> $y = \frac{4}{3}x - \left(\frac{1}{2}x + \frac{7}{2}\right)$ $y = \frac{4}{3}x - \frac{1}{2}x - \frac{7}{2}$ $y = \frac{8}{6}x - \frac{3}{6}x - \frac{7}{2}$ $y = \frac{5}{6}x - \frac{7}{2}$
2	<p>Student response includes the following 2 elements.</p> <ul style="list-style-type: none"> Computation component = 1 point <ul style="list-style-type: none"> Correct prediction for the amount of profit after 10 months of operation based on the profit function in Part B Modeling component = 1 point <ul style="list-style-type: none"> Valid justification for the answer

Sample Student Response:

To predict the profit after 10 months, use the profit function and substitute 10 for x , since x represents the number of months the company has been in business.

$$y = \frac{5}{6}x - \frac{7}{2}$$

$$y = \frac{5}{6}(10) - \frac{7}{2}$$

$$y = \frac{29}{6} = 4\frac{5}{6}$$

After 10 months, we predict that *Muffins A-plenty* will have a profit of $4\frac{5}{6}$ thousand dollars, which rounds to \$4,833.

Other correct and mathematically appropriate methods are acceptable.

Genesis Convert Table

Task Point	Genesis Score
0	55
1	59
2	69
3	79
4	89
5	100