1. You are given the following data regarding MoMo&Co's current production of widgets, where $q$ represents the number of widgets produced. It appears as though this data follows a linear trend.

| Revenue (in thousands of \$) | 0 | 15 | 30 |
|---|---|---|---|
| Cost (in thousands of \$) | 10 | 15 | 20 |
| Quantity $q$ | 0 | 500 | 1000 |


(a) Find the cost $C(q)$ as a function of the number of widgets produced, $q$.

(b) Find the revenue $R(q)$ as a function of the number of widgets produced, $q$.

(c) How many widgets $q$ must MoMo&Co produce in order to make money?

(d) For what value of $q$ do we have that $R(q) = C(q)$? Interpret this.

2. "*Hi Noon Industries*" has cost and revenue functions (in dollars) given by:

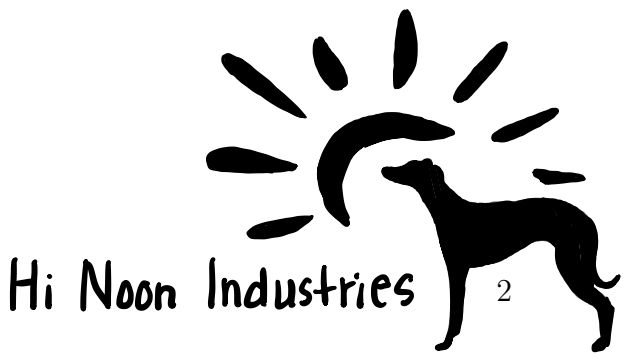
$$C(q) = 6000 + 10q \qquad \textit{and} \qquad R(q) = 12q$$

where $q$ represents the number of units of their product that are produced.

(a) Find the cost and revenue if *Hi Noon Industries* produces 500 units. Do they make a profit?

(b) Compute the cost and revenue if 5000 units are produced. Do they make a profit?

(c) What is the marginal profit for *Hi Noon Industries*?



3. *Happy Hound Coffee Company* has the following cost and revenue functions (in dollars) that model the cost and revenue of producing and selling $q$ bags of dog-themed coffee mugs.


$$C(q) = q^2 - 100q + 7500 \qquad \textit{and} \qquad R(q) = 75q$$

Find the break-even point(s), and interpret your answer.