

Close tonight: HW 13.3

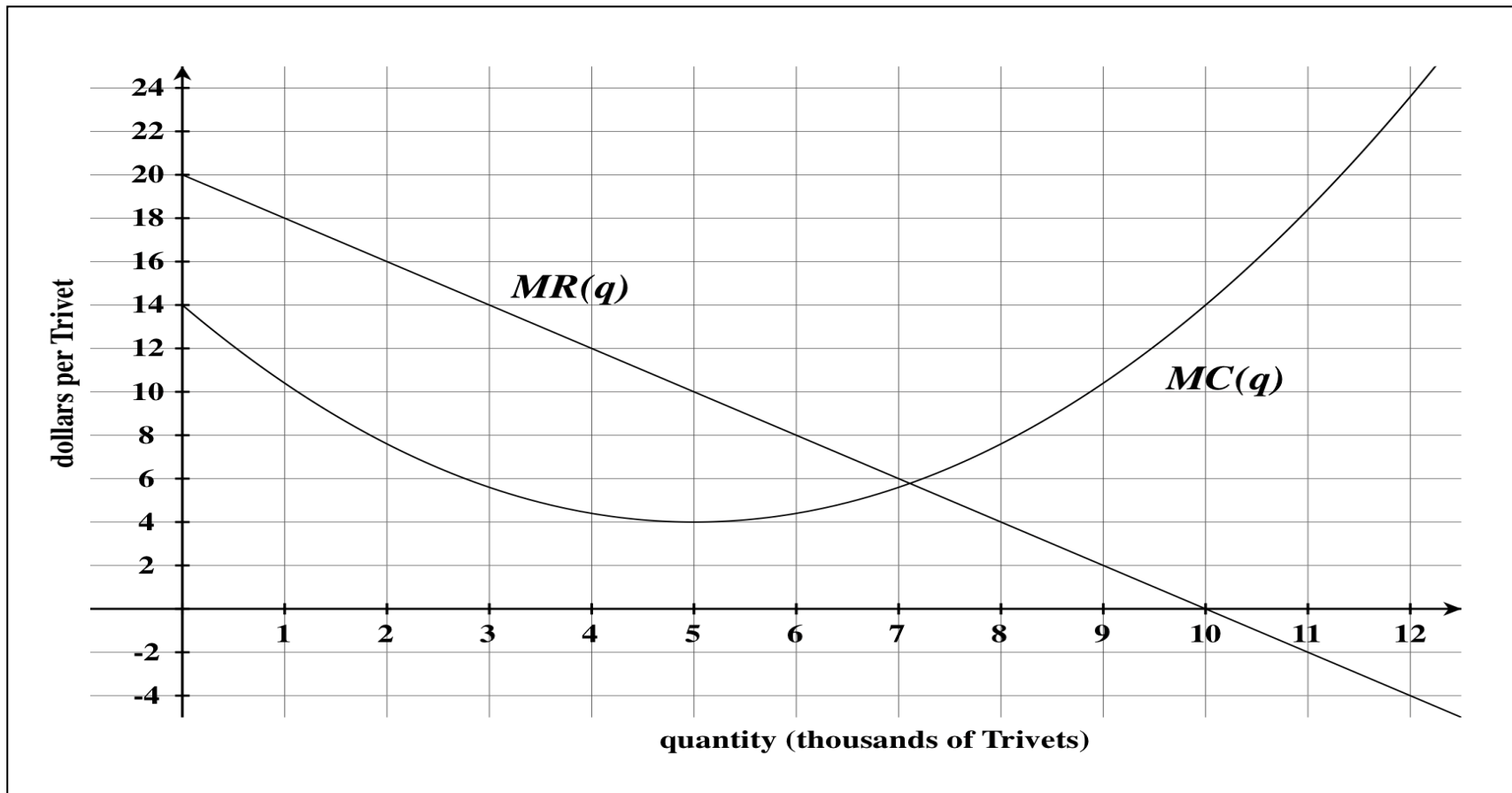
*Entry Task:* MR/MC graphs are given.

Assume Fixed Cost is \$15,000.

So  $TC(0) = 15$  thousand dollars.

Use the graph to estimate:

- Maximum TR = ??
- Profit at  $x = 2$  thousand Trivets.
- Maximum Profit = ??
- Challenge question: At what quantities is profit equal to zero?



*Example:* At time  $t = 0$  min, a Red and Green balloon are next to each other at 60 feet. The **rate of ascent** of each balloon is given by

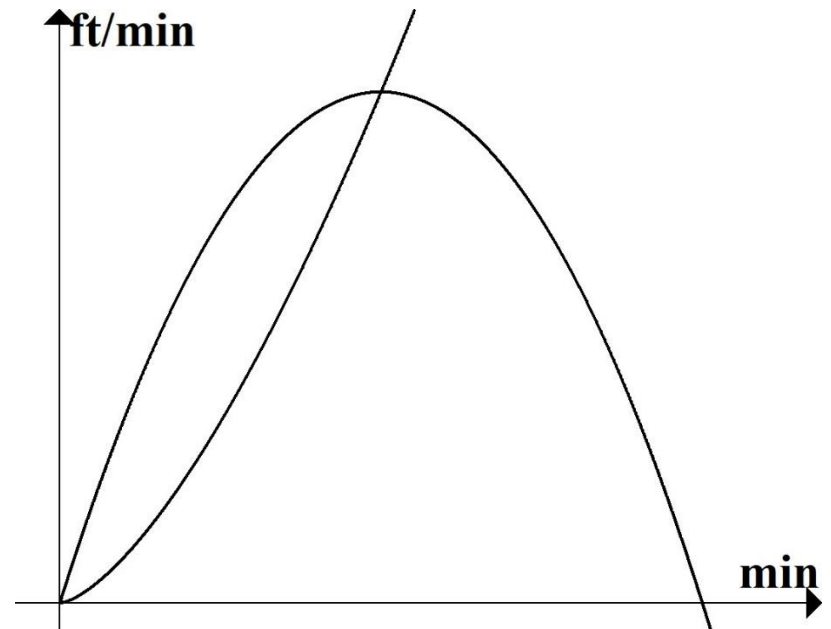
$$R'(t) = -\frac{1}{2}t^2 + 4t \quad \text{feet/min}$$

$$G'(t) = t^{3/2} \quad \text{feet/min}$$

These graphs intersect at  $t = 4$ .

What do the following represent?

- Area under  $R'(t)$  from 0 to 4.
- Area under  $G'(t)$  from 0 to 4.
- Area between from 0 to 4.



The last example is the exact same idea as getting profit from MR and MC.

If you want to get *distance between* two balloons directly from the graphs of their derivatives:

1. Find the area between the derivatives from 0 to the desired time.
2. Whatever deriv. is on top is the balloon going faster (treat that area as positive if that is the balloon you are treating as ahead).

*You do:* Find the area of the region bounded by the y-axis and

$$y = 14 - 2x$$

$$y = 2 + x.$$

If  $x$  is in hundreds of items and

$$y = MR(x) = 14 - 2x \quad \$/\text{item}.$$

$$y = MC(x) = 2 + x \quad \$/\text{item}.$$

What does the area you just found represent?

What additional information would you like to know?