## Breakeven price and shutdown price — review

setup This is the setup: As usual, we produce items of some kind, but this time, we don't control their price. Instead, we can only sell them at the market price, which is p dollars per item. Over time, p can vary. We want to know whether we can make a profit or not at that price. If it turns out we can't make a profit, we would like to know if it's worth selling anything at all to help cover rent and other fixed costs.

In this situation, the graph of total revenue is a diagonal line with slope p. For instance, some possible graphs of TR are:
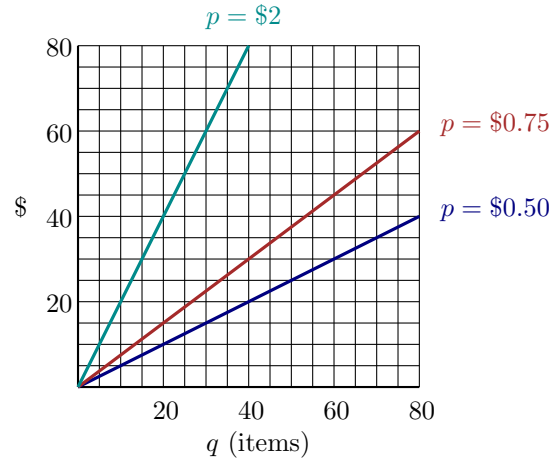
breakeven price The answer to the first question turns out to be *yes* only if p is bigger than the *breakeven price*, BEP. The breakeven price is the slope of the *lowest* diagonal line that still hits TC.

slope of TR = BEP
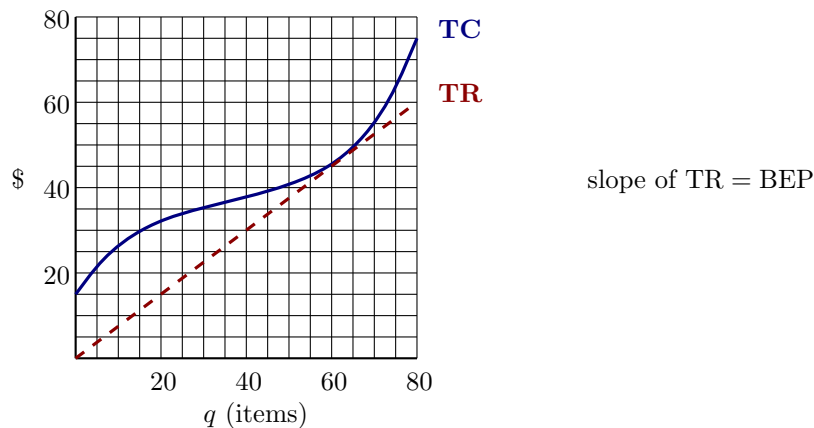
When p > BEP, the TR graph will be above TC in some places, so we can make a profit. Otherwise, TR will always be below TC; we'll never make a profit:
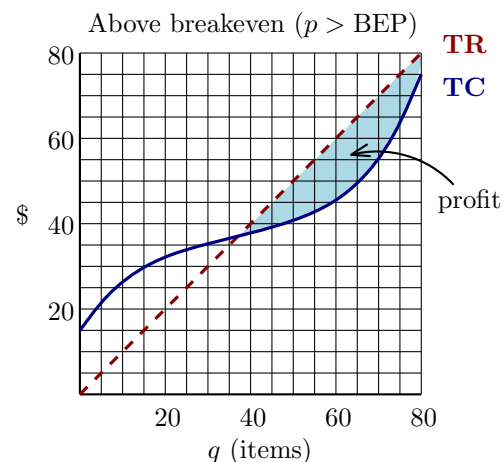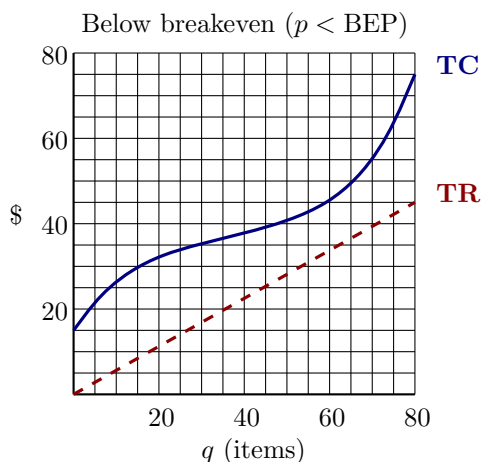
There are three ways to find BEP:
- Use rolling ruler to find the lowest diagonal line through the TC graph. BEP is the *slope* of this line.
- BEP is the lowest value of AC.
- If you have graphs of AC and MC, then BEP is the y-coordinate of the point where AC and MC cross.

shutdown price If we can't make a profit, are we still able to make something towards paying our fixed costs? Yes, as long as p is bigger than the *shutdown price* SDP. This is the slope of the lowest diagonal line that hits VC (just like breakeven price, except with VC instead of TC).

When p > SDP, the TR graph will be above VC in some places. And, when TR > VC, we earn TR − VC dollars towards our fixed costs.

When p < SDP, the TR graph is always below VC. In that case, we won't earn any money to help pay rent, no matter how much we produce.

Just like BEP, there are three ways to find SDP:
- Use rolling ruler to find the lowest diagonal line through the VC graph. SDP is the *slope* of this line.
- SDP is the lowest value of AVC (average variable cost).
- If you have graphs of AVC and MC, then SDP is the y-coordinate of the point where AVC and MC cross.