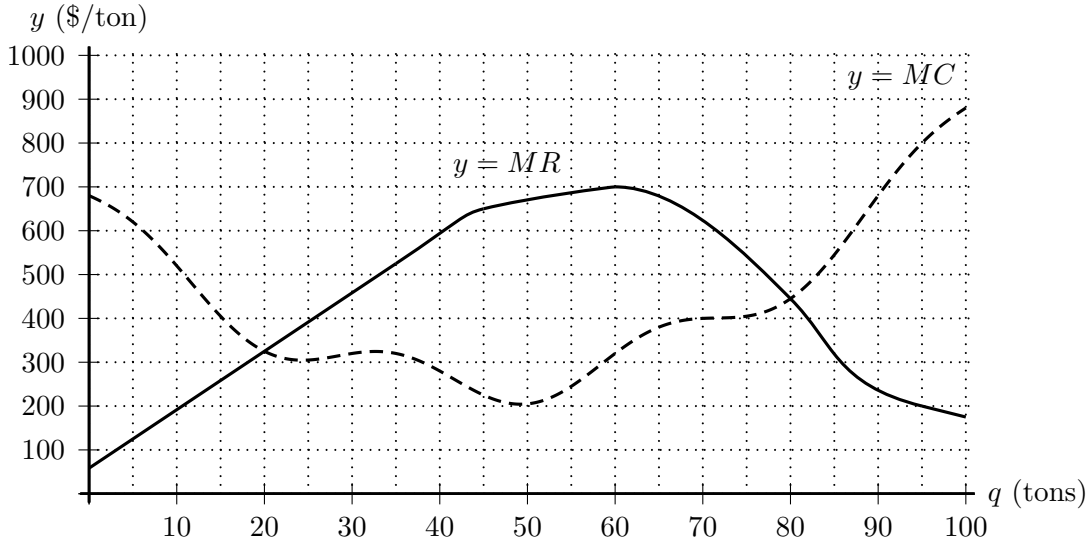
**9**. [9 points] With winter past and summer approaching, David is opening a business selling ice. Graphed below are his marginal revenue $MR$ (solid line) and marginal cost $MC$ (dashed line), in dollars per ton of ice.




**a**. [4 points] Carefully estimate the answer to each of the following based on the graphs above. You do not need to show your work.

(i) For what value(s) of $q$ in the interval $[0, 100]$ is revenue maximized?

**Answer:** $q =$ _____

(ii) For what value(s) of $q$ in the interval $[0, 100]$ is $MR$ maximized?

**Answer:** $q =$ _____

(iii) For what value(s) of $q$ in the interval $[0, 100]$ is profit maximized?

**Answer:** $q =$ _____

(iv) For what value(s) of $q$ in the interval $[0, 100]$ is $MR - MC$ maximized?

**Answer:** $q =$ _____

**b**. [2 points] David is planning to sell 5 tons of ice but is considering selling 35 tons instead.

(i) Would David's profit increase or decrease if he changed the amount of ice sold from 5 tons to 35 tons? (Circle one.)

INCREASE DECREASE

(ii) By how much would his profit increase or decrease? (Circle the one best estimate.)

\$1000 \$2000 \$4500 \$5250 \$6000

**c**. [3 points] Let $\pi(q)$ be David's profit, in dollars, if he sells $q$ tons of ice. Suppose that David would make a profit of \$4000 if he sold 95 tons of ice. Find an equation for the tangent line to the graph of $y = \pi(q)$ at $q = 95$.

**Answer:** _____