1. Since \( C(100) = 2000 \) and \( C'(100) = 15 \), we know that the cost of producing 100 items is $2000 and that at this production level, costs are increasing at $15 per item. If costs continue to increase at this rate, then the cost of producing 102 items would be $2030.

2. (a) At \( q = 80 \), marginal cost (MC) is greater than marginal revenue (MR) since the slope on the cost graph is greater than the slope on the revenue graph.

(b) Increase production since \( MR > MC \) at \( q = 50 \). In this case, the company will be increasing its profits.

(c) Increase production since \( MR > MC \) at \( q = 20 \). In this case, the company will be reducing its losses.

(d) Maximum profit occurs at \( q \approx 70 \) where the profit is \( R(70) - C(70) = $7000 - $4000 = $3000 \).

(e) \( MR = MC \) at \( q \approx 70 \) and \( q \approx 8 \). The company obtains its maximum profit at \( q \approx 70 \) and suffers its greatest loss at \( q \approx 8 \).