MEASURING THE COST OF REDUCING POLLUTION

With the renewed emphasis on reducing pollution, many factories have installed equipment to reduce the amount of particles that are emitted from industrial smokestacks. Recently, a large factory found that the cost \( C \) in dollars of reducing particle pollution from one of its smokestacks was given by the rational equation

\[
C = \frac{780,000p}{100 - p}
\]

where \( p \) is the percent of pollution to be removed. Determine what it will cost to remove a certain percent of the pollution.

1. What is the cost to remove 20% of the pollution? (\( p = 20 \))
2. What is the cost to remove 40% of the pollution?
3. What is the cost to remove 60% of the pollution?
4. What is the cost to remove 80% of the pollution?

Determine the increase in the cost as more and more of the pollution is removed.

5. How much did the cost increase as the factory went from removing 20% of the pollution to 40%?
6. How much did the cost increase as the factory went from removing 60% of the pollution to 80%?
7. Compare the answers to Problems 5 and 6. What is the significance of the change as more and more of the pollution is removed?
8. If the amount of pollution removed was increased from 20% to 40%, what was the percent change of the cost? (You may read to use a formula from unit 11.)
9. If the amount of pollution removed was increased from 90% to 99.9%, what was the percent change of the cost?
10. According to this formula, is it possible for 100% of the pollution to be removed? Why?
11. Graph the equation. Describe how the graph verifies the answers to questions 8, 9, and 10.
12. Find what percent of the pollution is removed if the cost \( C \) is $1,820,000. Discuss how you got your answer.