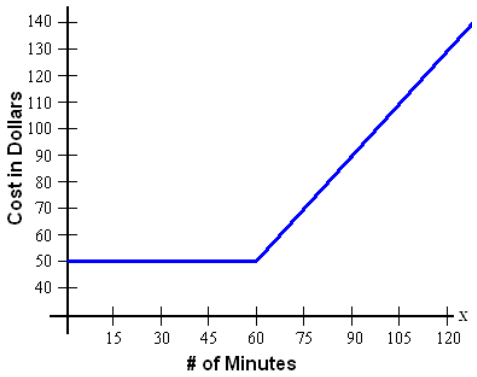
This lab includes problems based on graphing various functions and application problems involving the slope and equations of lines.

Recommended Procedures:

Solve the following problems, providing detailed steps wherever required.

1. (10 points) What test can we use to determine if a graph is a function or not? Explain in your own words.
2. (25 points) The following graph displays the rates of a computer service technician:



The following piecewise function is described as the following:

$$f(x) = \begin{cases} \$50 & if \quad 0 \le x \le 60 \\ \frac{4}{3}x - 30 & if \quad x > 60 \end{cases}$$

   a. Find the cost if the computer service technician works for 45 minutes.
   b. Find the cost if the computer service technician works for 105 minutes.

3. (5 points) Write the equation to find the slope of an equation.
4. (5 points) Write the point-slope form.
5. (5 points) Write the slope-intercept form.
6. (20 points) The total sales of a company in 2008 was $45,000 dollars. In 2011, it grew to $84,000 dollars. Use x as the number of years since 2000 and y as the total sales.

   Hint: Use the points (8, $45,000) and (11, $84,000).

   a. Find the rate of change (slope).
   b. Write an equation in both point-slope form and slope-intercept form, modeling the company's sales.

c. What are the projected sales for the year 2016? (16 years after 2000).

7. (20 points) Let $f(x) = x + 4$ and $g(x) = x^2 + 8x - 3$. Find each of the following functions:
   a. $(f + g)(x)$
   b. $(f - g)(x)$
   c. $(fg)(x)$
   d. $f \circ g$

   Hint: $f\big(g(x)\big)$

8. (10 points) Find the inverse of $f(x) = -\frac{9}{x} + 8$.

Submission Requirements:

- Your lab report will be a Word document.
- Be sure you have answered each question correctly before final submission for grading. Include a header containing your name and the date on each page. Name the document **MA1210_nn_Lab4-1.docx**, replacing **nn** with your initials. Use Arial 12-point font and double-line spacing.

Evaluation Criteria:

Your submission will be evaluated against the following criteria:

- Did you answer all the questions correctly?
- Did you include appropriate steps and any formulas or properties to determine the answers to questions wherever required?
- Did you correctly answer each question?
- Did you submit answers in an organized fashion that was legible and easy to follow?