1. Chapter 2, Section 2.6, Question 002

Use the given graph to answer the following questions.

(a) What are the x-values for which the function appears to be not continuous?

a. Function $g$ appears not continuous at $x = 2, 4$.
b. Function $g$ appears not continuous at $x = 2$.
c. Function $g$ appears not continuous at $x = 4$.
d. Function $g$ appears continuous at all x-values shown.
e. Function $g$ appears not continuous at $x = 4, 6$.

Answer: 

(b) What are the x-values for which the function appears to be not differentiable?

a. Function $g$ appears not differentiable at $x = 2, 4$.
b. Function $g$ appears not differentiable at $x = 4, 6$.
c. Function $g$ appears not differentiable at $x = 3, 4$.
d. Function $g$ appears differentiable at all x-values shown.
e. Function $g$ appears not differentiable at $x = 2, 4, 6$.

Answer: 

2. Chapter 2, Section 2.6, Go Tutorial Problem 013

The acceleration due to gravity, $g$, varies with height above the surface of the earth, in a certain way. If you go down below the surface of the earth, $g$ varies in a different way. It can be shown that $g$ is given by

$$g = \begin{cases} \frac{GM}{r^2} & \text{for } r < R \\ \frac{GM}{R^2} & \text{for } r \geq R \end{cases}$$

where $R$ is the radius of the earth, $M$ is the mass of the earth, $G$ is the gravitational constant, and $r$ is the distance to the center of the earth.

a) Sketch a graph of $g$ against $r$.

Choose the correct graph number from the table above:
b) Is \( g \) a continuous function of \( r \)?

c) Is \( g \) a differentiable function of \( r \)?