In Exercises 25–28, use differentials and the graph of \( g' \) to approximate (a) \( g(2.93) \) and (b) \( g(3.1) \) given that \( g(3) = 8 \).

\[ \text{25.} \quad g' \]

\[ \text{26.} \quad g' \]

\[ \text{27.} \quad g' \]

\[ \text{28.} \quad g' \]

29. **Area** The measurement of the side of a square is found to be 12 inches, with a possible error of \( \frac{1}{64} \) inch. Use differentials to approximate the possible propagated error in computing the area of the square.

30. **Area** The measurements of the base and altitude of a triangle are found to be 36 and 50 centimeters. The possible error in each measurement is 0.25 centimeter. Use differentials to approximate the possible propagated error in computing the area of the triangle.

31. **Area** The measurement of the radius of the end of a log is found to be 14 inches, with a possible error of \( \frac{1}{4} \) inch. Use differentials to approximate the possible propagated error in computing the area of the end of the log.

32. **Volume and Surface Area** The measurement of the edge of a cube is found to be 12 inches, with a possible error of 0.03 inch. Use differentials to approximate the maximum possible propagated error in computing
   (a) the volume of the cube.
   (b) the surface area of the cube.
33. Area The measurement of a side of a square is found to be 15 centimeters. The possible error in measuring the side is 0.05 centimeter.

(a) Approximate the percent error in computing the area of the square.

(b) Estimate the maximum allowable percent error in measuring the side if the error in computing the area cannot exceed 2.5%.

34. Circumference The measurement of the circumference of a circle is found to be 56 centimeters. The possible error in measuring the circumference is 1.2 centimeters.

(a) Approximate the percent error in computing the area of the circle.

(b) Estimate the maximum allowable percent error in measuring the circumference if the error in computing the area cannot exceed 3%.

35. Volume and Surface Area The radius of a sphere is measured to be 6 inches, with a possible error of 0.02 inch. Use differentials to approximate the maximum possible error in calculating (a) the volume of the sphere, (b) the surface area of the sphere, and (c) the relative errors in parts (a) and (b).

36. Profit The profit $P$ for a company is given by

$$P = (500x - x^2) - \left( \frac{1}{2} x^2 - 77x + 3000 \right).$$

Approximate the change and percent change in profit as production changes from $x = 115$ to $x = 120$ units.

In Exercises 37 and 38, the thickness of the shell is 0.2 centimeter. Use differentials to approximate the volume of the shell.

37. A cylindrical shell with height 40 centimeters and radius 5 centimeters is to be constructed using a material whose thickness $s$ is modeled by $s = -0.002x^2 + 0.01x$. Approximate the change in volume of the shell as $x$ increases from 10 to 12.

38. A conical shell with height 30 centimeters and radius 25 centimeters is to be constructed using a material whose thickness $s$ is modeled by $s = 0.003x^3 - 0.1x^2 + 0.04x$. Approximate the change in volume of the shell as $x$ increases from 10 to 12.