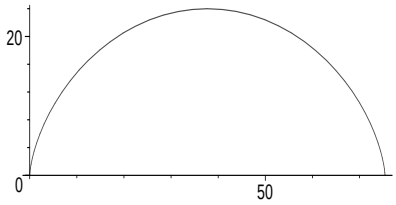
due next lab Name _____

1. When a bicycle wheel with radius 12 inches turns, the path that is taken by a spot on the tire is called a cycloid and its parametric equations are given as:

$$\begin{aligned} x(t) &= 12t - 12\sin(t) \\ y(t) &= 12 - 12\cos(t) \end{aligned}$$

Determine the arclength of one arch of the cycloid.



2. Determine $(\overline{x}, \overline{y})$, the center of mass, centroid for the region bounded by the x-axis and the function $y = \sqrt{x-1}$ on $1 \leq x \leq 10$.

3. Write the number given as a geometric series, then write it as a fraction by determining the sum of the series.

(a) $0.\overline{4}$

(b) $3.\overline{45}$

(c) $0.\overline{9}$

4. Determine the sum of the geometric series.

(a) $\displaystyle\sum_{n=3}^{\infty} 5\left(\frac{3}{4}\right)^n$

(b) $\displaystyle\sum_{n=1}^{\infty} \frac{2}{3}\left(\frac{-9}{10}\right)^n$

(c) $\displaystyle\sum_{n=0}^{\infty} \frac{2 \cdot 3^{n+2}}{7 \cdot 5^n}$

(d) $\displaystyle\sum_{n=1}^{\infty} \frac{2 \cdot 4^{n+2}}{3^{2n+1}}$

5. Use partial fractions to determine the sum of the telescoping series $\displaystyle\sum_{n=2}^{\infty} \frac{2}{n^2 + 2n - 3}$.

6. Determine whether the series converges or diverges.

$\displaystyle\sum_{n=1}^{\infty} \frac{3}{n}$ _____ $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n}{n}$ _____

$\displaystyle\sum_{n=1}^{\infty} \frac{2 \cdot 3^{n+4}}{5 \cdot 4^{n-1}}$ _____ $\displaystyle\sum_{n=1}^{\infty} \frac{2 \cdot 3^{2n-1}}{4^{n+1}}$ _____