1. The rate at which temperature is dropping is 
\[-2t - t^2\] degrees Fahrenheit per hour \(t\) hours after the sundown. How much had the temperature decreased by 4 hours after sundown?

\[
\int_{3}^{2} (x^2 - 2x)\,dx \\
\int_{4}^{9} \frac{6}{\sqrt{x}}\,dx \\
\frac{d}{dx} \left( x - \frac{1}{x} \right)^2
\]

3. An unpolluted lake has a volume of \(10^8\) m\(^3\). A river containing 5% pollution flows into the lake at the rate of \(2 \times 10^5\) m\(^3\)/day. The same amount of pure water evaporates from the lake each day, leaving the volume of the lake unchanged.

a) What is the percentage pollution in the lake after \(t\) days?

b) When does the pollution reach 1%?

4. What is the average value of the function \(f(x) = 3 + x^2\) between \(x = -1\) and \(x = 3\)?

5. The acceleration of an object at time \(t\) is given by \(a(t) = 2t + 3\) m/sec\(^2\). The velocity at time \(t = 0\) is 4 m/s.

a) What is the velocity at time \(t = 3\)?

b) How far does the object move during the first 5 seconds?