Assignment # 3
Due 12noon Wednesday 7th December

Assignment #3: Integration

We use $ln(x)$ for the Natural Logarithm function.

1. Find
   1. the area under the curve of $y = \sqrt{x-4}$ between 4 and 8.
   2. the curve $y = f(x)$ that passes through the point $(9, 4)$ where the derivative of $f(x)$ is $3 * \sqrt{x}$ i.e. $f'(x) = 3 * \sqrt{x}$.
2. Determine
   1. $\int (sin\,\theta) * (cos^5\theta)\, d\theta$.
   2. $\int \frac{1}{x * ln(x)}\, dx$.
3. Show that
   1. $\int_2^4 \frac{1}{x * (ln(x))^2}\, dx = \frac{1}{ln(4)}$.
   2. $\int_0^1 9^x dx = \frac{4}{ln(3)}$.
4. Approximate a value for $ln(5)$ using the series:
   $\ln(\frac{1+x}{1-x}) = 2 * (x + \frac{x^3}{3} + \frac{x^5}{5} + \frac{x^7}{7} \ldots)$, for $|x| < 1$
   Note: for $t > 1$, $ln(t) = \ln(\frac{1+x}{1-x})$, where $x = \frac{t-1}{t+1}$.
   (Use the first 3 terms of the series).