Num. _____**Name.** _____

(1)(15%)
Evaluate $\lim_{h\to 0} \frac{1}{h} \int_2^{2+h} \sqrt{5+t^2}\ dt$

(2) (15%)
Find the area of the region bounded by the graphs of $x = y^2$ and $y = x-2$.

(3)(15%)
Evaluate $\int \frac{e^x}{\sqrt{1-e^{2x}}}\ dx$

(4)(15%)
Evaluate $\lim_{x\to 0^+} x^x$

(5)(10%)
Evaluate the limit by interpreting it as the limit of a Riemann sum of a function on the interval $[0, 1]$

$$\lim_{n\to\infty} \frac{1}{n} \sum_{k=1}^{n} (\frac{k}{n})^{\frac{1}{3}}$$

(6)(10%)
Evaluate $\int_1^3 \frac{\ln x}{x}\ dx$

(7) (10%)
If $f(x) = \int_2^x \frac{dt}{\sqrt{1+t^3}}$, where $x > -1$, what is $(f^{-1})'(0)$?

(8)(10%)
Evaluate $\int_0^1 \frac{e^x}{1+e^x}\ dx$