

Directions: Show all work on a separate sheet of paper for full credit.

1. Write the expression as a power of e.

- a)  $4^{-\pi}$
- b)  $10^{x^2}$

2. Evaluate the expression.

- (a)  $\log_{10} \sqrt{10}$
- (b)  $\log_{10} 40 + \log_{10} 2.5$

3. Evaluate the limit.

- (a)  $\lim_{x \rightarrow -\infty} (1.001)^x$
- (b)  $\lim_{x \rightarrow \infty} \arctan(e^x)$

4. Differentiate the function.

- (a)  $a(x) = x^5 + 5^x$
- (b)  $b(x) = x \sin(2^x)$
- (c)  $c(x) = 3^{\cos(2x)}$
- (d)  $d(x) = (1 + 10^{\ln(x)})^6$
- (e)  $e(x) = x^x$
- (f)  $f(x) = (\sin(x))^{\ln(x)}$

5. Evaluate the integral.

- (a)  $\int_0^4 2^x dx$
- (b)  $\int (x^5 + 5^x) dx$
- (c)  $\int \frac{\log_{10} x}{x} dx$
- (d)  $\int x 2^{x^2} dx$