

HW #5: Review for Math 151 Test III

Please turn in this homework April 25, 2002

- (1) Find $\lim_{x \rightarrow 0} \cos(x)^{\left(\frac{2}{x}\right)}$. You must show your work
- (2) A bacterial culture starts with 100 bacteria and after 2 hours there are 1000 bacteria. Find an expression for the number of bacteria after t hours and find when there will be 2000 bacteria.
- (3) Differentiate: (a) $e^{\arcsin(\ln(x))}$, (b) $(x^2 - 1)^{\cos(x)}$
- (4) A cylindrical container with no top is to hold 200 cm^3 . Material for the sides cost 2 cents per cm^2 and material for the bottom costs 5 cents per cm^2 . Find the dimensions of the container that will minimize the container's cost.
- (5) Evaluate: (a) $\int \frac{1}{\sqrt{1-x^2}} dx$, (b) $\int e^{\sin(x)} \cos(x) dx$, (c) $\int \frac{2x}{1+x^4} dx$
- (6) If $\int_1^4 f(x) dx = 5$ and $\int_2^4 f(x) dx = 2$ then what is $\int_1^2 f(x) dx$?
- (7) Find the area of the region between $y = \sin(x)$ and $y = \cos(x)$ from $x = 0$ to $x = \frac{3\pi}{2}$