Name: Date:

Calculus 2 Final Exam Review

1. Given $y = x^3$ find the surface area and volume of the given object when rotated around the x-axis.
2. Evaluate $\int \frac{x}{1+x^2}\,dx$
3. Evaluate $\int \frac{1}{1+x^2}\,dx$
4. Evaluate $\int \frac{1}{1-x^2}\,dx$
5. Does $\sum_{n=1}^{\infty}\left(\frac{1}{n^3}+\frac{1}{3^n}\right)$ converge or diverge?
6. A tank contains 1000L of brine with 15kg of dissolved salt. Pure water enters the tank at a rate of 10 L/min. The solution is kept thoroughly mixed and drains from the tank at the same rate. How much salt is in the tank after 20 minutes?
7. Find the distance from the point P (2, 1, 4) to the plane through the points Q(1, 0, 0), R(0, 2, 0), and S(0, 0, 3). Use the formula $d = \frac{|a\cdot(b\times c)|}{|a\times b|}$ where $a = \overrightarrow{QR}, b = \overrightarrow{QS}, \text{and } c = \overrightarrow{QP}$.