Quiz 4, Calculus 2

Name: _____

1. (4 points) A trough has the shape of a triangular prism, with the pointy end down. The triangle is isosceles, with a base of 3 feet and height of 6 feet. The trough is 10 feet long. Suppose that the trough is only filled up to half of its depth with water. Set up, but **do not integrate** an integral that represents how much work is needed to pump out all of the water over the side of the trough. As usual, the density of water is 62.5 lbs/ft^3.

2. (2 points) Determine if the sequence $a_n = \dfrac{\cos^2 n}{2^n}$ converges or diverges. If it converges, find the limit. Make sure to explain your reasoning.

3. (4 points) Determine if the series is convergent or divergent. If it converges, find the limit. Make sure to explain your reasoning.

   (a) $1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \cdots$

   (b) $\displaystyle\sum_{n=0}^{\infty} \frac{3^{n+1}}{\pi^n}$