Quiz 16

Name: _____

Decide which of these integrals converge or diverge. If they converge, calculate their value.

1. $\displaystyle\int_1^\infty \frac{1}{x^2}\,dx$

   This is the integral we studied in class with $p = 2$, which we know will converge. The value is

   $$-\frac{1}{x}\Big|_1^\infty = \lim_{N\to\infty} \frac{-1}{N} + 1 = 1.$$

2. $\displaystyle\int_2^\infty \frac{1}{x}\,dx$

   This is the case $p = 1$, which we know is divergent. Indeed,

   $$= \ln(x)\Big|_2^\infty = \lim_{N\to\infty} \ln(N) - \ln(2) = \infty.$$