MATH1502 A1 and A2, Quiz 2, May 29, Summer 2007

NAME:

Problem 1 (10 points). Evaluate $\int_0^\infty xe^{-x}dx$. (Hint: integration by parts).

Same as B.

Problem 2 (10 points). Decide whether $\sum \frac{2+\sin k}{k^2}$ converges.

$\sum \frac{2+\sin k}{k^2} \leq \sum \frac{3}{k^2}$: conv by p-series

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$I =$

Problem 1 (10 points). Evaluate $\int_0^\infty xe^{-x}dx$. (Hint: integration by parts).

$$I = \lim_{b\to\infty} \int_0^b xe^{-x}\,dx$$

$u = x \qquad dv = e^{-x}dx$

$du = dx \qquad v = -e^{-x}$

$$I = \lim_{b\to\infty} -xe^{-x}\Big|_0^b - \int_0^b -e^{-x}\,dx$$

$$= \lim_{b\to\infty} -xe^{-x} - e^{-x}\Big|_0^b$$

$$= \lim_{b\to\infty} \frac{-b}{e^b} - \frac{1}{e^b} + 0 + e^0$$

$$= 1$$

Problem 2 (10 points). Decide whether $\sum \frac{2+\cos k}{k^2}$ converges.

$$\sum \frac{2+\cos k}{k^2} \le \sum \frac{3}{k^2}$$: converge by p-series

$(p = 2 \ge 1)$