Evaluate the improper integrals that converge.

1) $\displaystyle\int_{0}^{\infty} \frac{1}{1+x^2}\, dx$

2) $\displaystyle\int_{0}^{\infty} \frac{\log x}{x^2}\, dx$

3) $\displaystyle\int_{e}^{\infty} \frac{1}{x\log x}\, dx$