1. Determine whether each of the following improper integrals converges or diverges. (The first 4 are from Monday, the last 3 are new)

(a) $\displaystyle\int_2^\infty \frac{1}{x^3 + 2}\, dx$

(b) $\displaystyle\int_5^\infty \frac{1}{\sqrt{x} - 2}\, dx$

(c) $\displaystyle\int_2^\infty \frac{2}{\sqrt{x} + x^2}\, dx$

(d) $\displaystyle\int_0^\infty \frac{2}{\sqrt{x} + x^2}\, dx$

(e) $\displaystyle\int_2^\infty \frac{1}{x^3 - 2}\, dx$

(f) $\displaystyle\int_3^\infty \frac{1}{2x + 2}\, dx$

(g) $\displaystyle\int_1^\infty \frac{e^x}{1 + e^x}\, dx$

   Hint: show that $f(x) > \dfrac{1}{2}$; to do that, notice that $e^x \geq 1$ for all $x \geq 0$.

2. Find or approximate the value of $\displaystyle\int_2^\infty \frac{1}{x^3 - 2}\, dx$.