Some Improper Integral Questions

Part I: Determine if the improper integral converges. Evaluate it or explain why it diverges.

1. $\int_{43}^{\infty} \frac{1}{z^3} \, dz$

2. $\int_{1}^{\infty} \frac{1}{1+x} \, dx$

3. $\int_{2}^{\infty} \frac{e^{2x}}{1+e^{2x}} \, dx$

4. $\int_{4}^{\infty} \frac{1}{\sqrt{y^2+1}} \, dy$

5. $\int_{3}^{\infty} \frac{2x+5}{(3x^2+15x+2)^3} \, dx$

Part II: Identify the type of improper integral and evaluate it if it converges.

1. $\int_{3}^{\infty} \frac{1}{x(\ln x)^2} \, dx$

2. $\int_{-\infty}^{-1} \frac{1}{x^{2/3}} \, dx$

3. $\int_{0}^{2} \frac{1}{\sqrt{4-x^2}} \, dx$

4. $\int_{0}^{\infty} \frac{1}{x^2} \, dx$

5. $\int_{0}^{\pi/2} \tan x \, dx$