Assignment 6-8

Which of the integrals in Problems 1-4 is/are improper. For any which are improper identify why the integral is improper. **Do not evaluate the integrals.**

1. $\int_0^9 \frac{x+3}{\sqrt[3]{x}}\,dx$
2. $\int_0^1 \frac{x^3}{3x-2}\,dx$
3. $\int_0^4 \frac{1}{x^2-4x-5}\,dx$
4. $\int_0^\infty \frac{x}{e^x}\,dx$

Evaluate these improper integrals or show that the integral diverges without using a calculator. Show correct limit symbolism.

5. $\int_0^9 \frac{1}{\sqrt{x}}\,dx$
6. $\int_2^{11} \frac{1}{\sqrt{(x-2)^3}}\,dx$
7. $\int_0^\infty \frac{4}{e^x}\,dx$
8. $\int_{-\infty}^0 e^{3x}\,dx$
9. $\int_1^\infty \frac{3}{x^4}\,dx$
10. $\int_1^\infty \frac{1}{\sqrt[3]{x}}\,dx$
11. $\int_{-\infty}^0 xe^x\,dx$
12. $\int_0^\infty \frac{x}{e^x}\,dx$
13. $\int_e^\infty \frac{1}{x(\ln x)^4}\,dx$
14. $\int_0^\infty \frac{e^x}{e^x+3}\,dx$
15. $\int_0^\infty \sin x\,dx$
16. $\int_0^1 x\ln x\,dx$
17. $\int_0^3 \frac{6}{x^2-9}\,dx$
18. $\int_0^9 \frac{1}{\sqrt[3]{x-1}}\,dx$
19. $\int_0^4 \frac{1}{(x-1)^2}\,dx$