2. (a) Explain why $\displaystyle\int_1^\infty \frac{1}{x(2x+5)}\,\mathrm{d}x$ is an improper integral.

(1)

(b) Prove that

$$\int_1^\infty \frac{1}{x(2x+5)}\,\mathrm{d}x = a\ln b$$

where a and b are rational numbers to be determined.

(6)