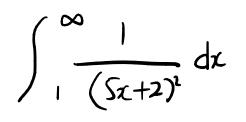
## Confirming an Integral Converges

Use limit comparison to show that  $\int_1^\infty \frac{dx}{(5x+2)^2}$  is finite.

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$$= \int_{1}^{\infty} \frac{1}{25x^2 + 20x + 4} dx$$

As 
$$x \neq \infty$$
,  $\frac{1}{25x^2 + 20x + 4} \cong \frac{1}{25x^2}$   

$$\lim_{N \to \infty} \int_{1}^{N} \frac{1}{25x^2} dx = \int_{1}^{\infty} \frac{1}{25x^2} dx = \frac{1}{25}$$

$$= \frac{1}{25} \left[ -\frac{1}{25} \right]_{1}^{\infty} \int_{1}^{\infty} \frac{1}{(5x+2)^2} dx \text{ is also}$$

$$= \frac{1}{25} (0+1) \qquad \text{a finite value}.$$