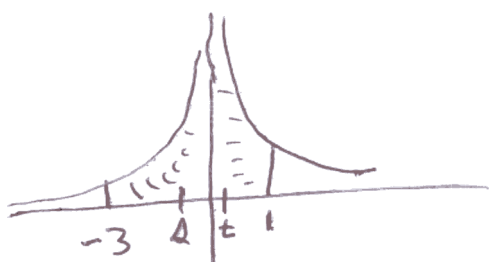


7. Find  $\lim_{x \rightarrow 1^-} \frac{x-1}{\arctan x} = \frac{0}{\neq 0} = \text{circle with 0}$



8. Find  $\int_{-3}^1 \frac{1}{x^2} dx = \lim_{A \rightarrow 0^-} \int_{-3}^A \frac{1}{x^2} dx + \lim_{t \rightarrow 0^+} \int_t^1 \frac{1}{x^2} dx$

$$= \lim_{A \rightarrow 0^-} \left[ -\frac{1}{x} \right]_{-3}^A + \lim_{t \rightarrow 0^+} \left[ -\frac{1}{x} \right]_t^1 = \lim_{A \rightarrow 0^-} \left( -\frac{1}{A} - \frac{1}{3} \right) + \lim_{t \rightarrow 0^+} \left( -1 + \frac{1}{t} \right)$$

$$= +\infty + \infty = +\infty$$

This integral diverges to  $+\infty$ .

Note  $\int_{-3}^1 \frac{1}{x^2} dx = \left[ -\frac{1}{x} \right]_{-3}^1 = \frac{1}{1} + \frac{1}{3} = -\frac{4}{3}$  is totally

wrong and will receive a grade of 0.

The number  $-\frac{4}{3}$  has no significance with respect to the above picture. The Fundamental Theorem of Calculus does not apply to this problem because  $\frac{1}{x^2}$  is not continuous at  $x=0$ .