SCHOOL SEMINARY DIOCESANO OF DUITAMA

Ejercicio George B. Thomas - tecnologia e informatica 2021

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1. Find the rational limit of each rational function exercise

$$1.)\ f(x) = \frac{x+1}{x^2+3} = \lim_{x\to\infty} \frac{x+1}{x^2+3}$$
$$= \lim_{x\to\infty} \frac{\frac{x}{x^2}+\frac{1}{x^2}}{\frac{x^2}{x^2}+\frac{3}{x^2}}$$
$$= \lim_{x\to\infty} \frac{\frac{1}{x}+\frac{1}{x^2}}{1+\frac{3}{x^2}}$$
$$= 0$$

$$2.)h(x) = \frac{-5+(7/x)}{3-(1/x^2)} = \lim_{x\to\pm\infty} \frac{\frac{-5}{x^2}+\frac{7}{x^3}}{\frac{3}{x^2}-\frac{1}{x^2}}$$
$$= \lim_{x\to\pm\infty} \frac{\frac{-5x+7}{x}}{3-\frac{1}{x^2}}$$
$$= \lim_{x\to\pm\infty} \frac{(-5x+7)x^2}{(3x^2-1)x}$$
$$= \lim_{x\to\pm\infty} \frac{-5x^2+7}{3x^2-1}$$
$$= -\frac{5}{3}$$

References:

Hass, J., Heil, C., & Weiler, M. D. (Eds.). (2018). Thomas' Calculus (Fourteenth edition). Pearson.

https://docs.google.com/document/d/15LsRQk4VvjIjeOIdnSwQFy_ICjbHFxIQiuyiVJDxnZk/edit?usp=sharing