Estrategias didácticas para la construcción de gráficas de funciones

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Funciones Polinomiales

Determine el dominio de la función

$$f(x) = Log_2\left[x(3x-6)^{2018}(x+4)^{2017}\right]$$

$$x(3x-6)^{2018}(x+4)^{2017} > 0$$

$$P(x) = x(3x-6)^{2018}(x+4)^{2017}$$

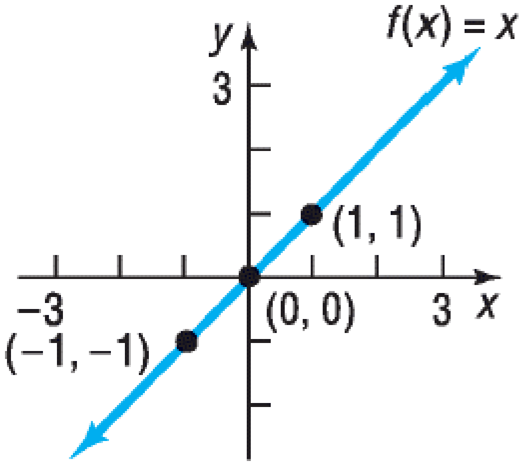
$$P(x) > 0$$

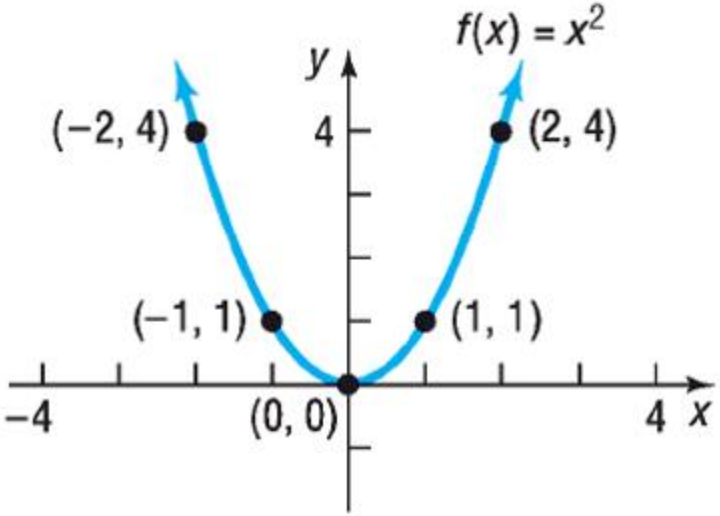
Limitaciones del álgebra

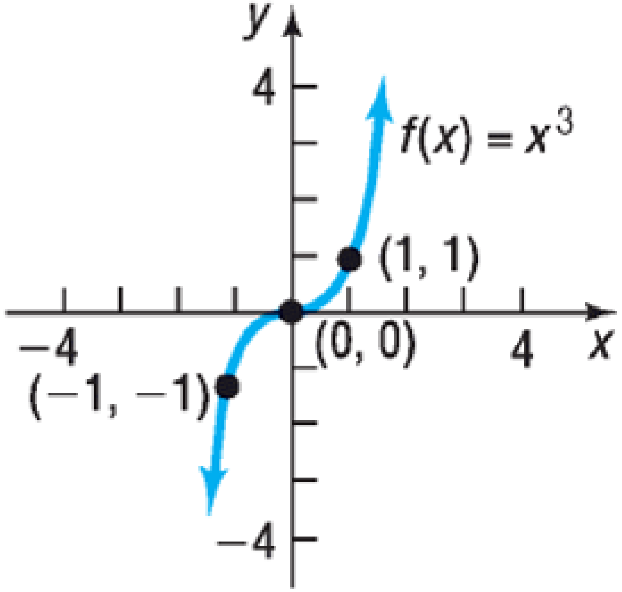
$$x = 0$$

$$x^2 = 0$$
$$x_1 = 0,$$
$$x_2 = 0$$

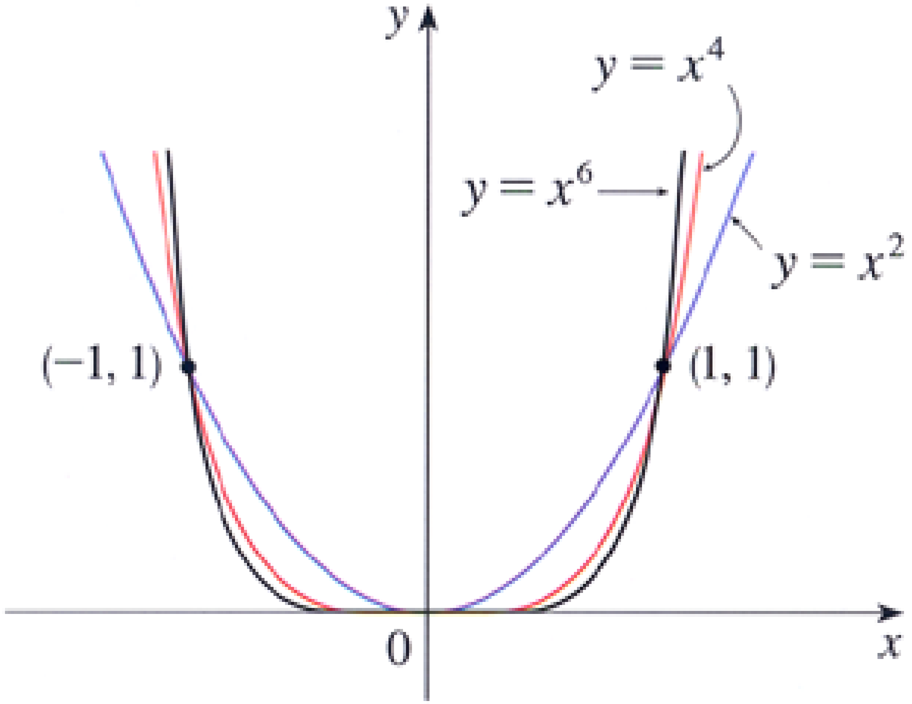
$$x^3 = 0$$
$$x_1 = 0,$$
$$x_2 = 0,$$
$$x_3 = 0$$

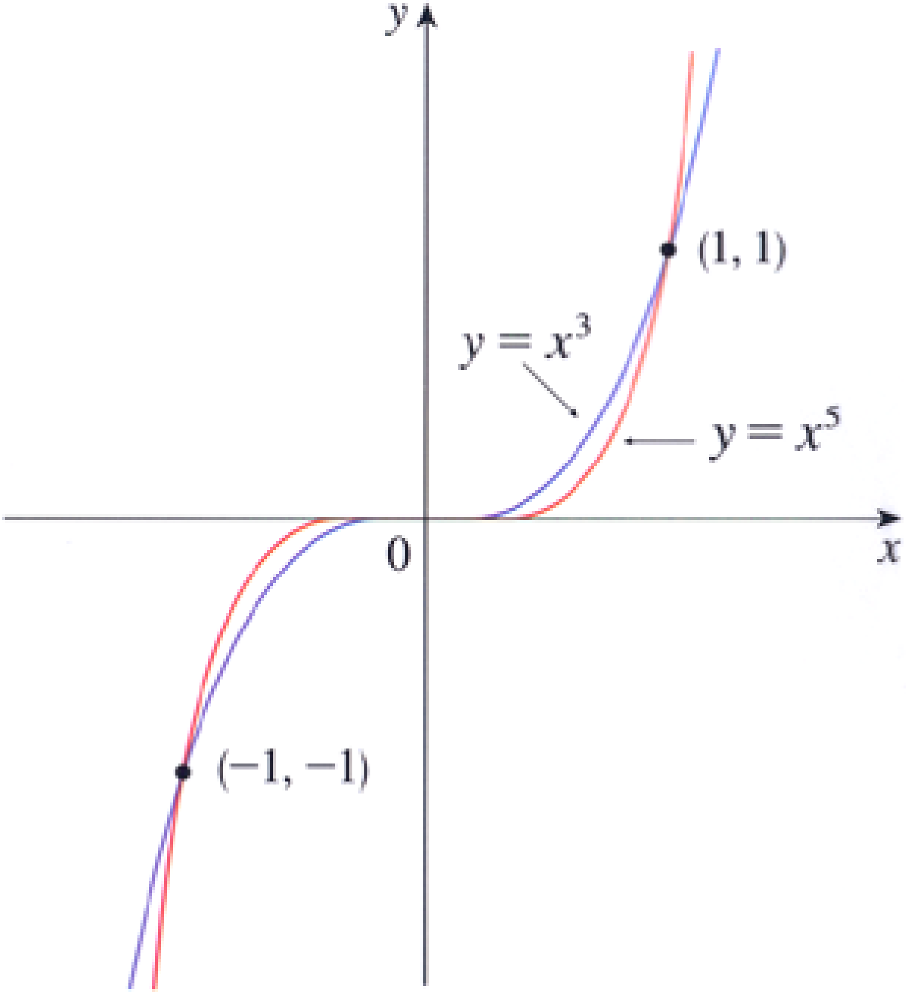




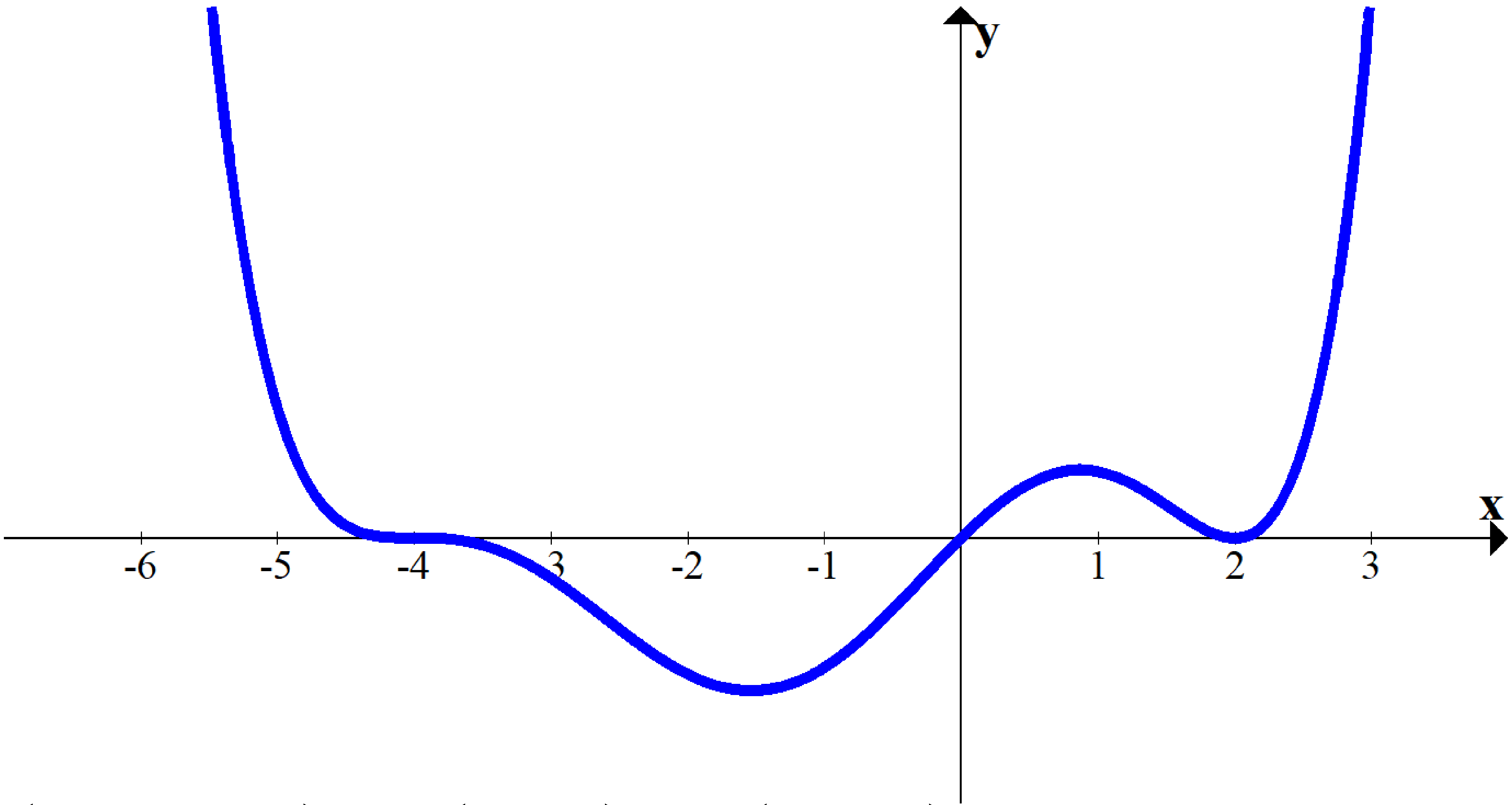


Familia de funciones potencia





$$x(3x-6)^{2018}(x+4)^{2017} > 0$$



$$x \in (-\infty, -4) \cup (0, 2) \cup (2, \infty)$$

Funciones Racionales

Determine el dominio de la función

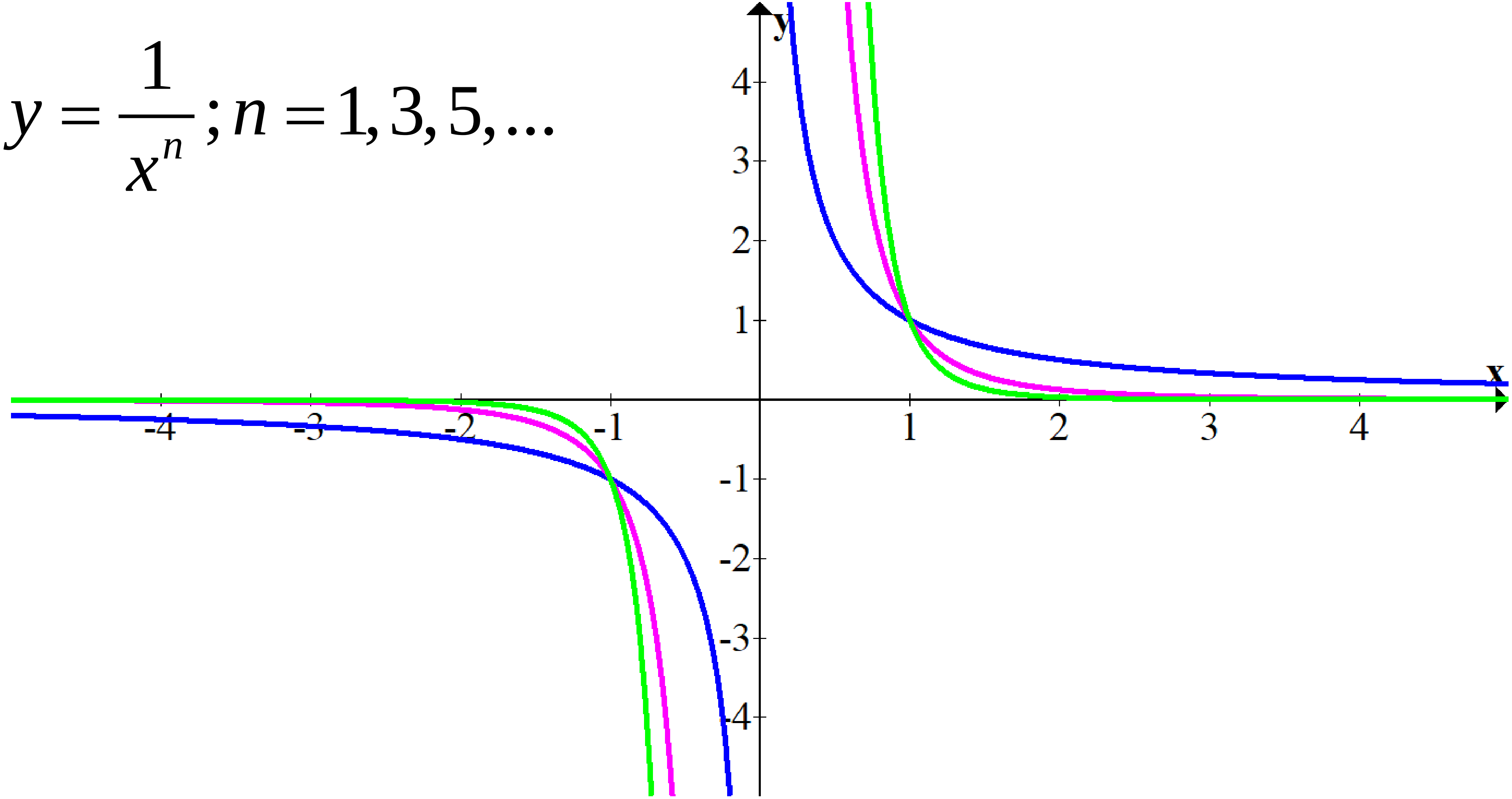
$$f(x)=\sqrt{\frac{(x+2)^2(x-3)^3(x+4)^5(x-7)}{(x+1)^2(x-5)^4(9-x)}}$$

$$\frac{(x+2)^2(x-3)^3(x+4)^5(x-7)}{(x+1)^2(x-5)^4(9-x)} \geq 0$$

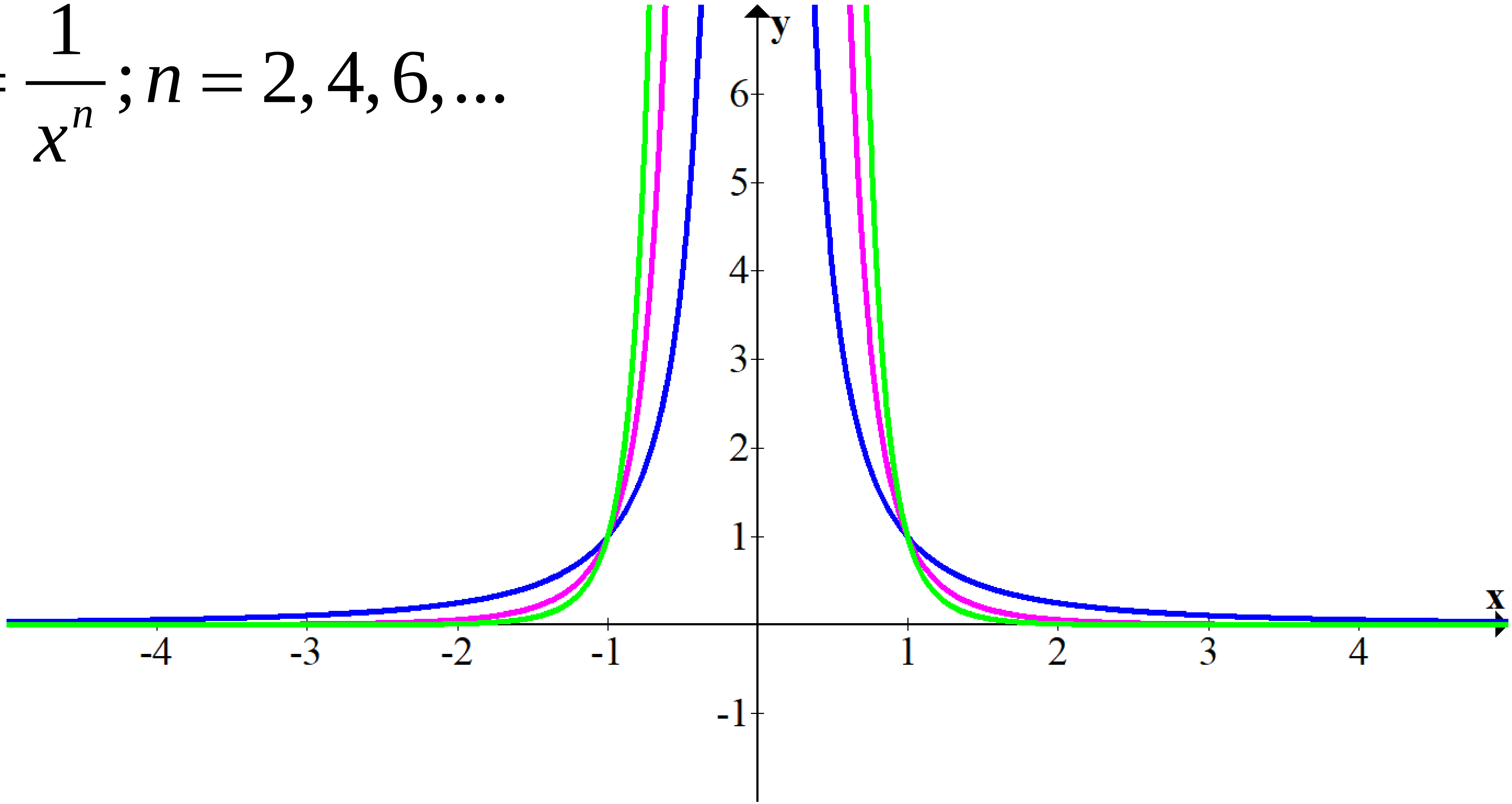
$$R(x) = \frac{(x+2)^2(x-3)^3(x+4)^5(x-7)}{(x+1)^2(x-5)^4(9-x)}$$

$$R(x) \geq 0$$

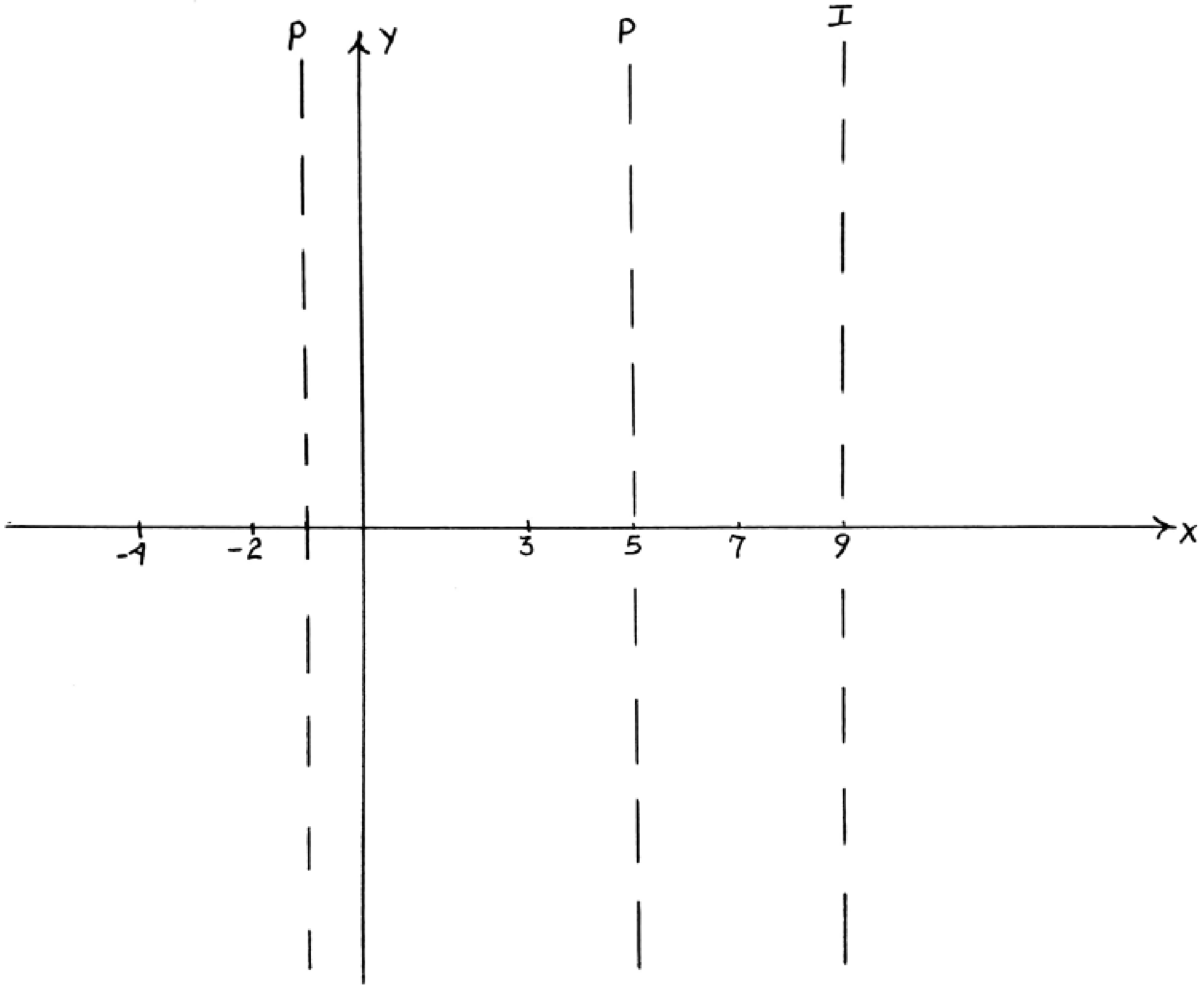
$$y = \frac{1}{x^n};\ n = 1, 3, 5, \ldots$$



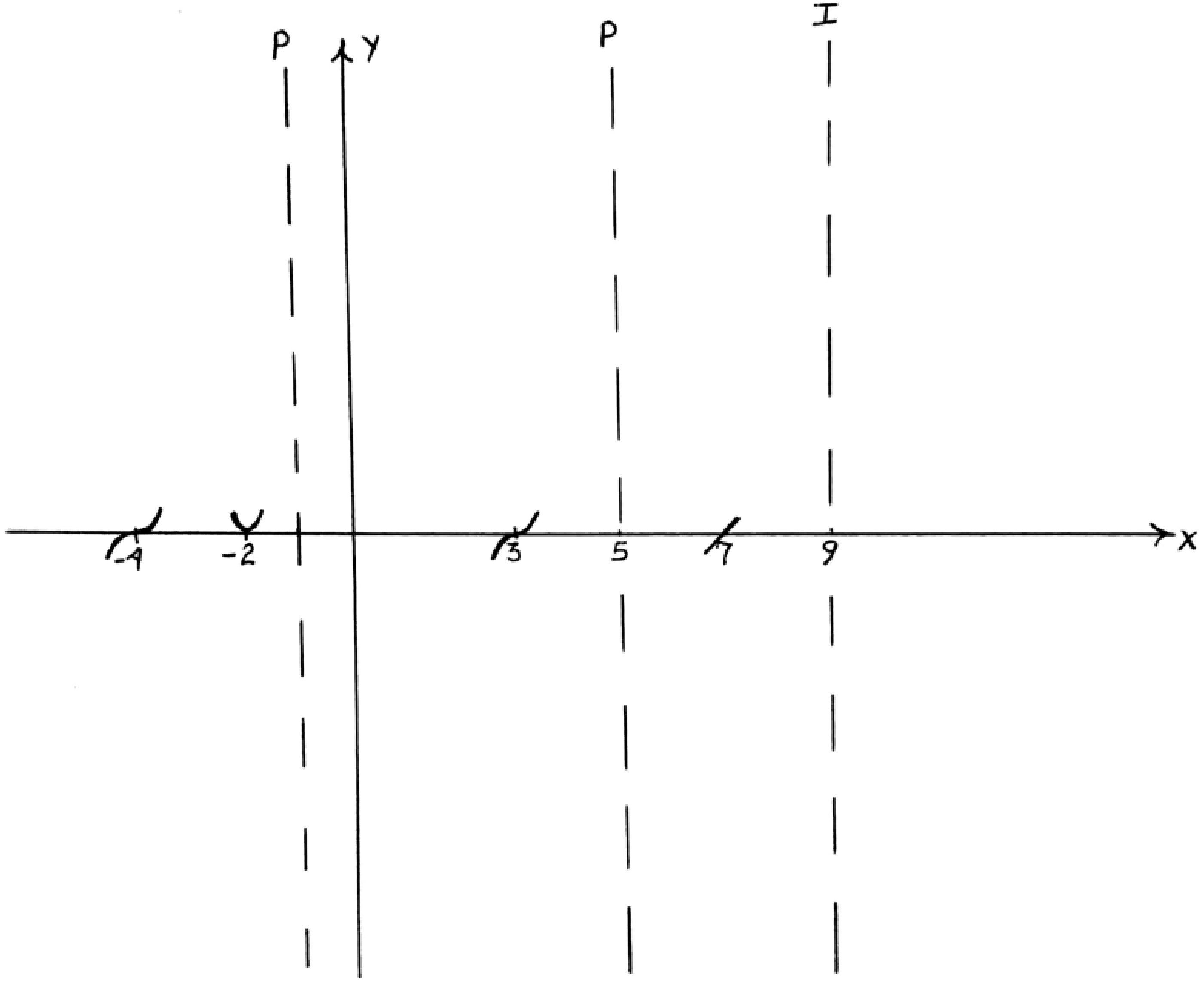
$$y = \frac{1}{x^n}; n = 2, 4, 6, \ldots$$



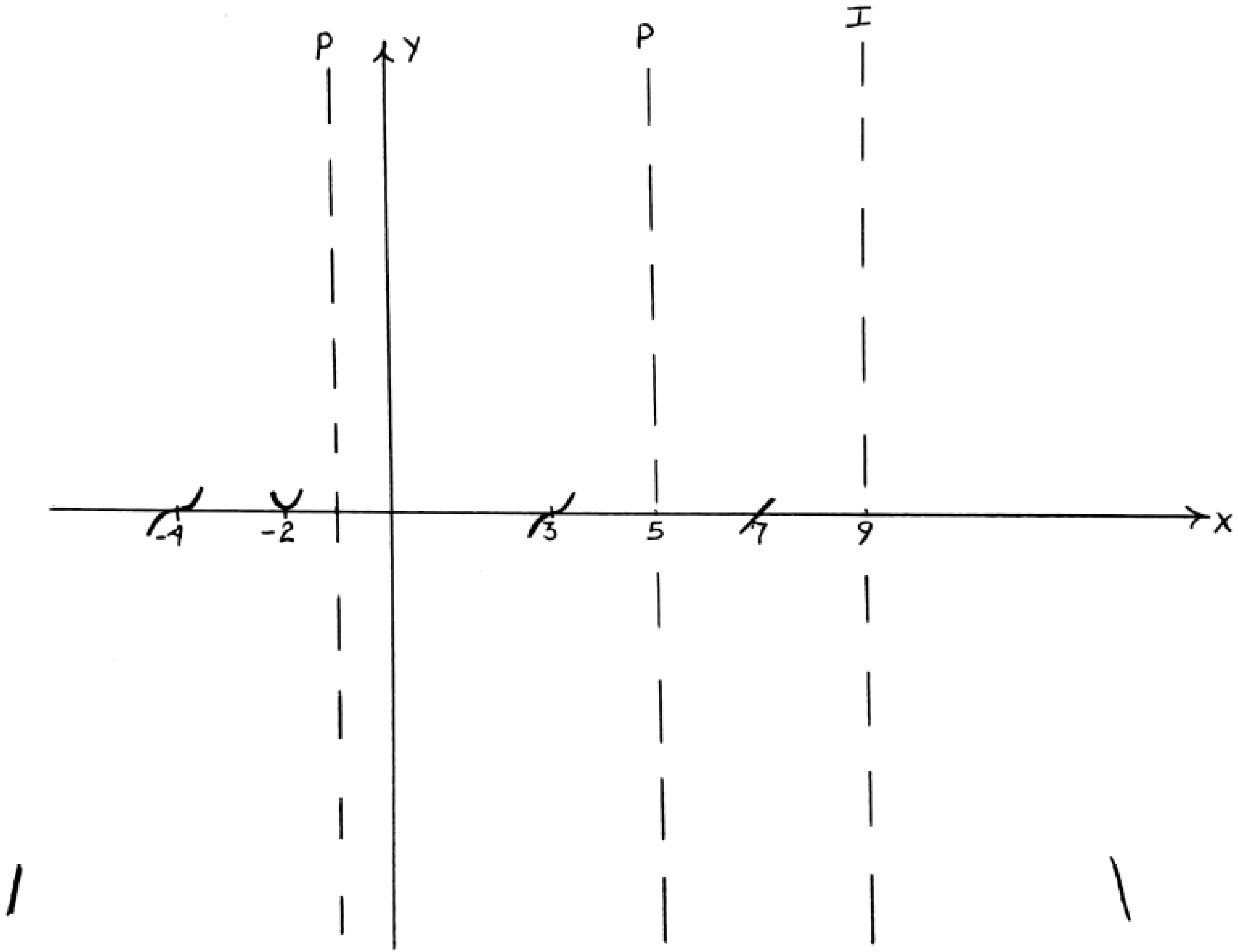
$$R(x)=\frac{(x+2)^2(x-3)^3(x+4)^5(x-7)}{(x+1)^2(x-5)^4(9-x)}$$



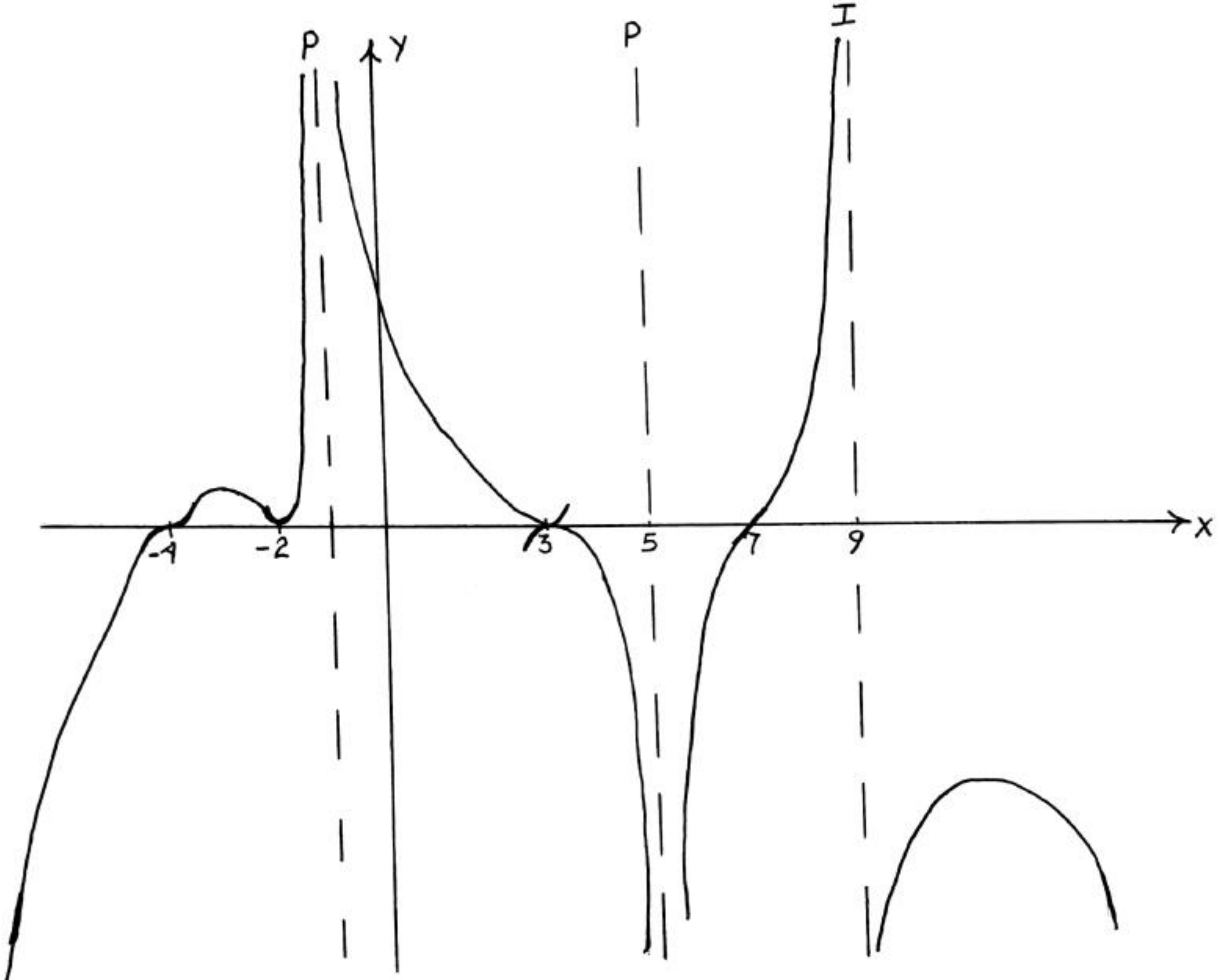
$$R(x)=\frac{(x+2)^2(x-3)^3(x+4)^5(x-7)}{(x+1)^2(x-5)^4(9-x)}$$



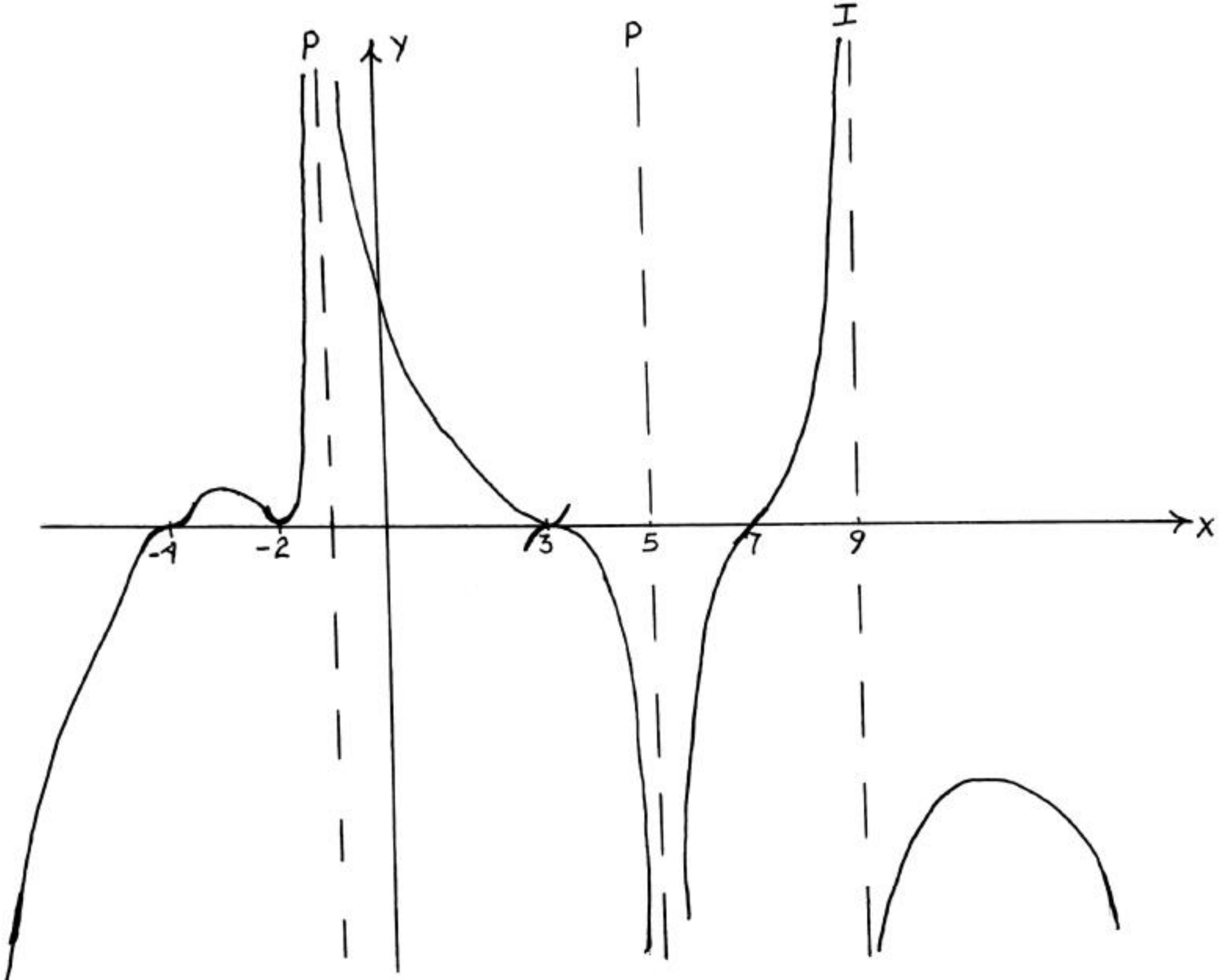
$$R(x)=\frac{(x+2)^2(x-3)^3(x+4)^5(x-7)}{(x+1)^2(x-5)^4(9-x)}$$



$$R(x)=\frac{(x+2)^2(x-3)^3(x+4)^5(x-7)}{(x+1)^2(x-5)^4(9-x)}$$

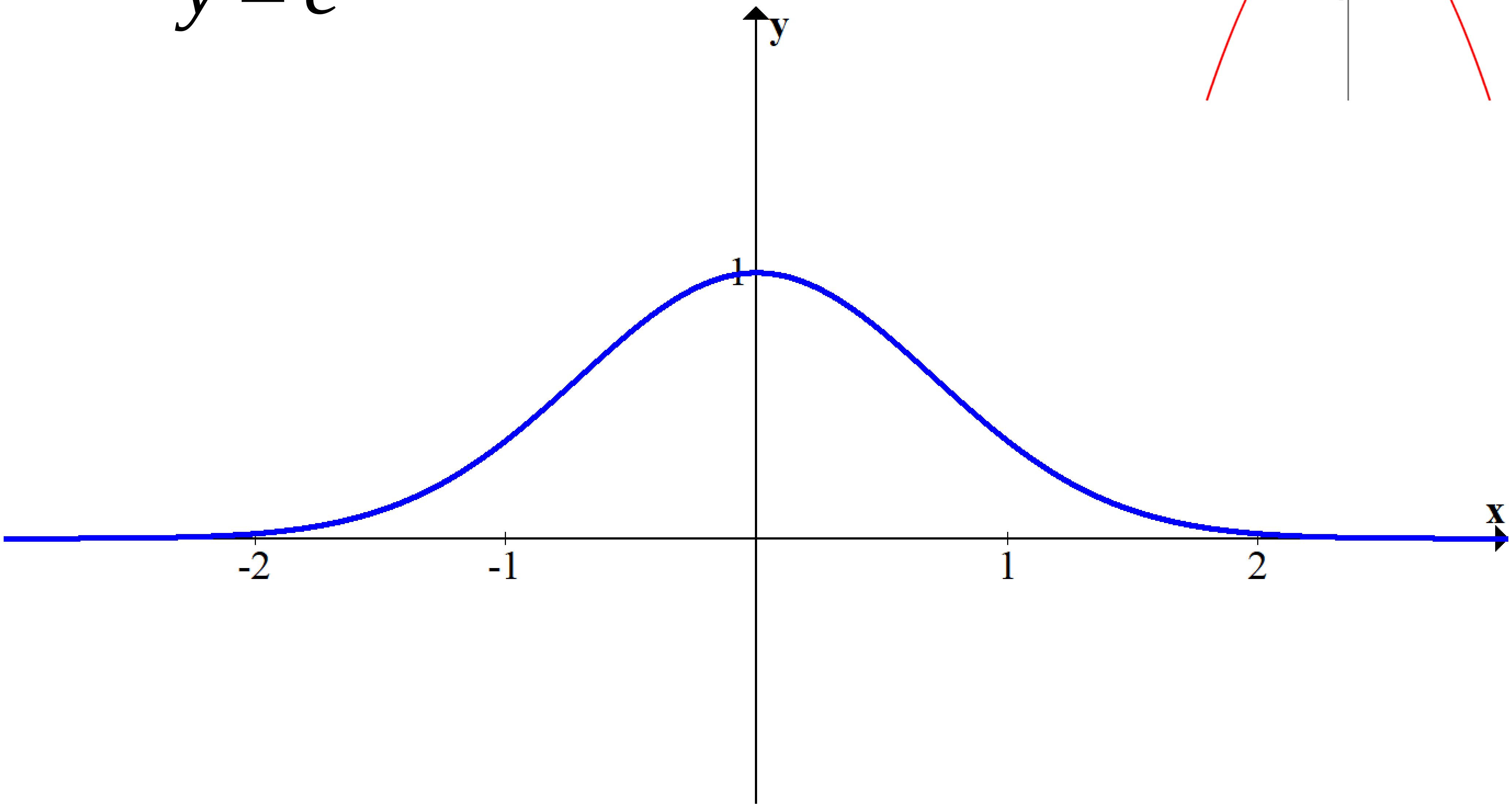


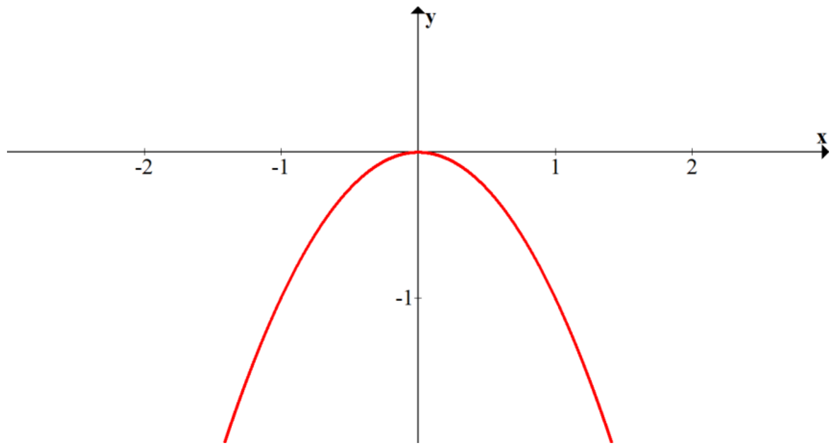
$$x \in [-4,-1) \cup (-1,3] \cup [7,9)$$



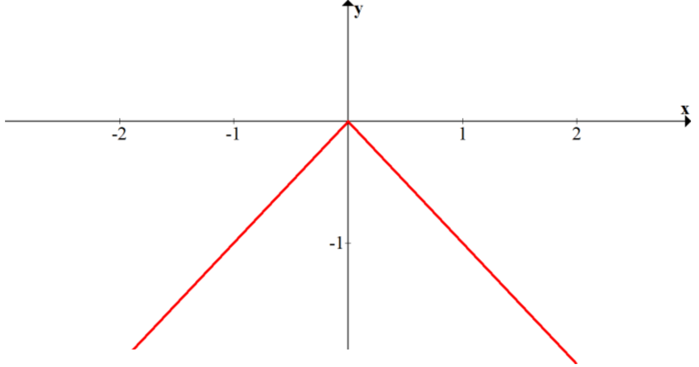
Campana de Gauss y algunas patologías

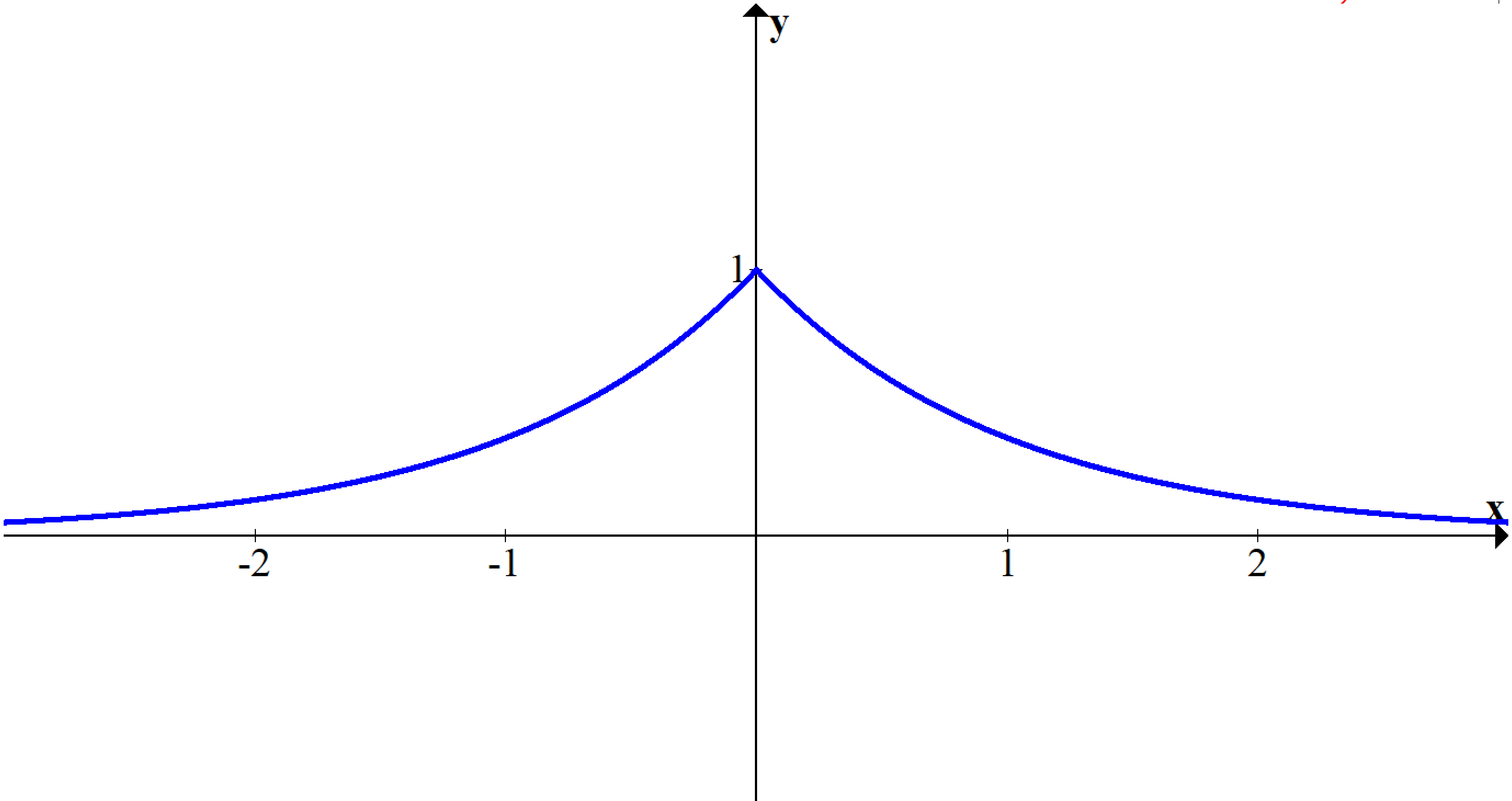
$$y = e^{-x^2}$$



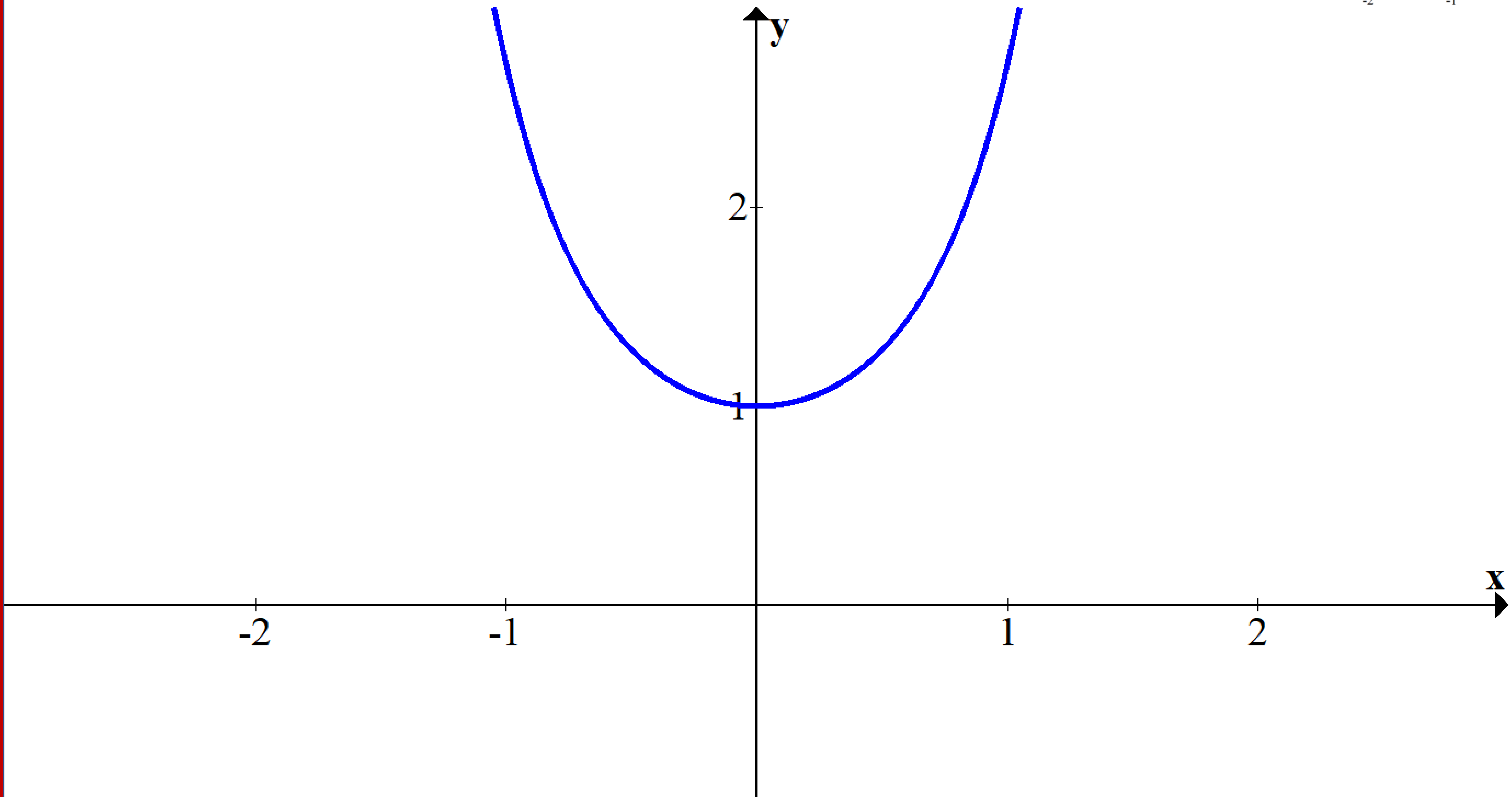


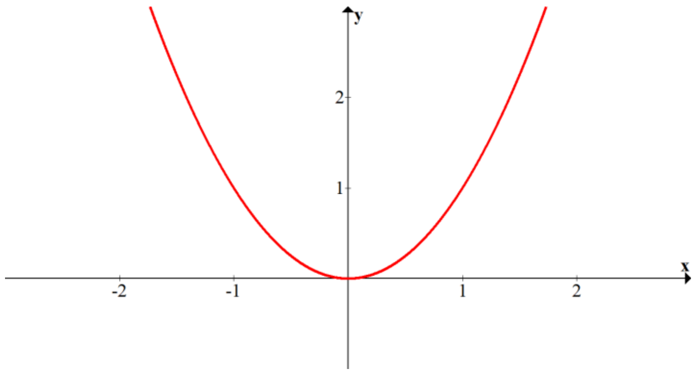
$$y = e^{-|x|}$$



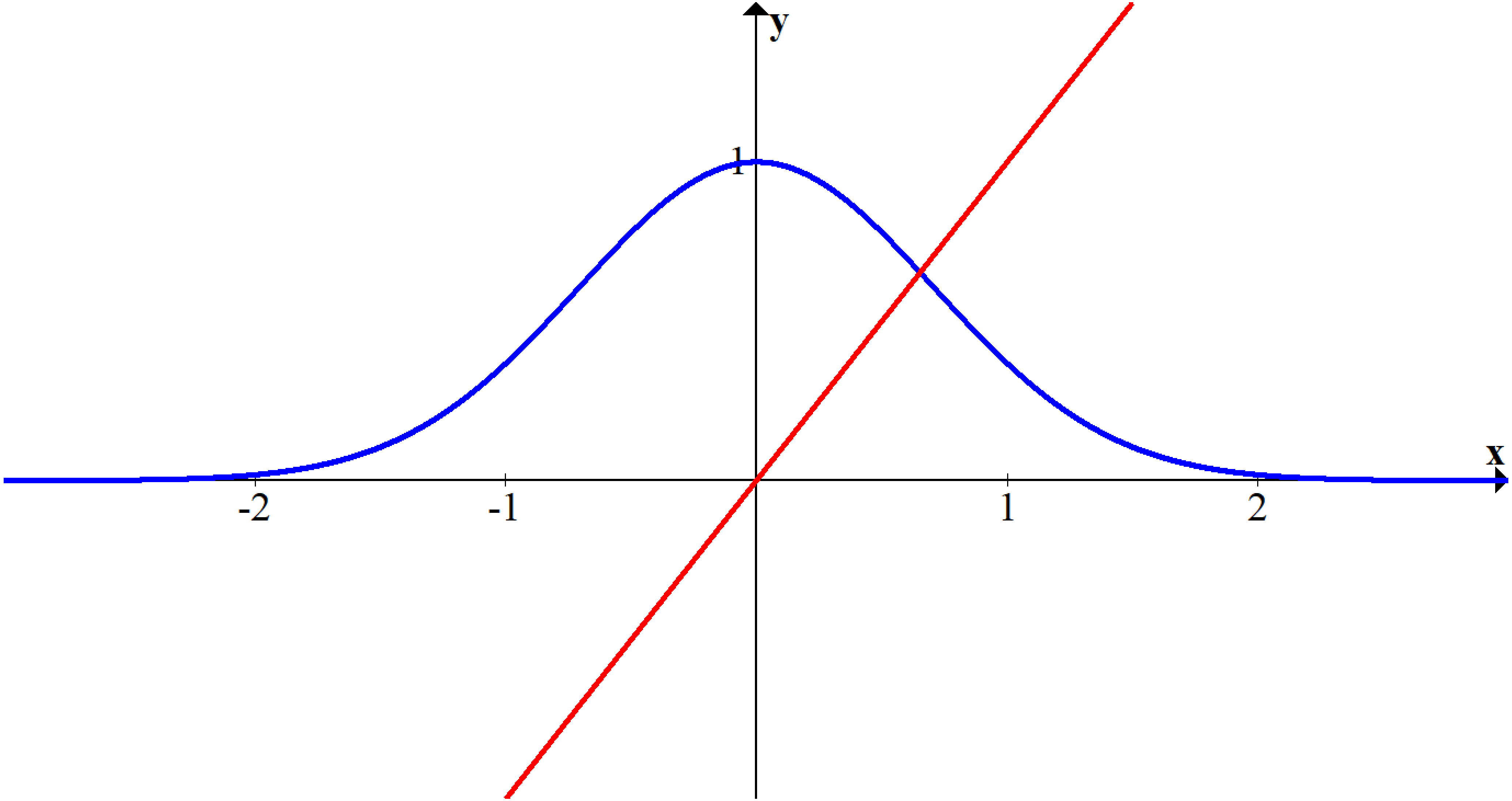


$$y = e^{x^2}$$

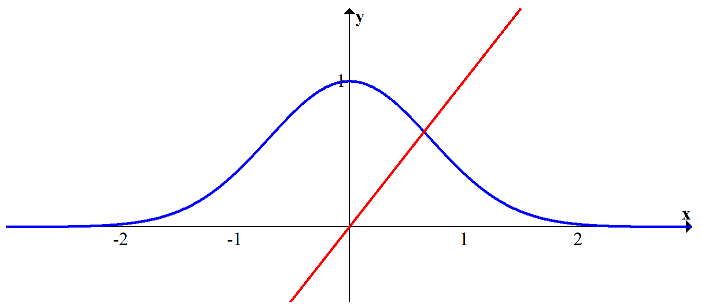


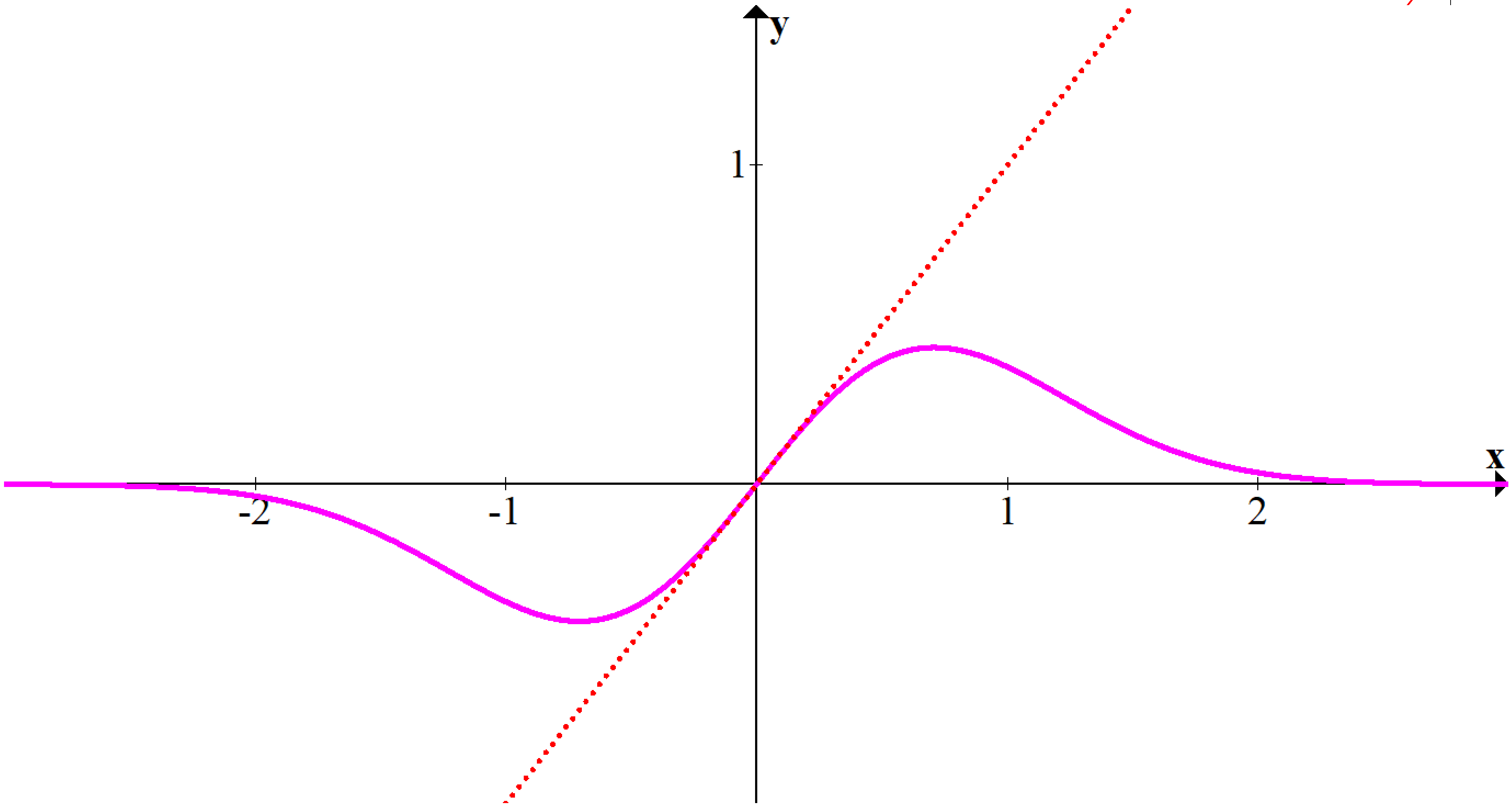


$$y = xe^{-x^2}$$



$$y = xe^{-x^2}$$





Mas allá de la función logística

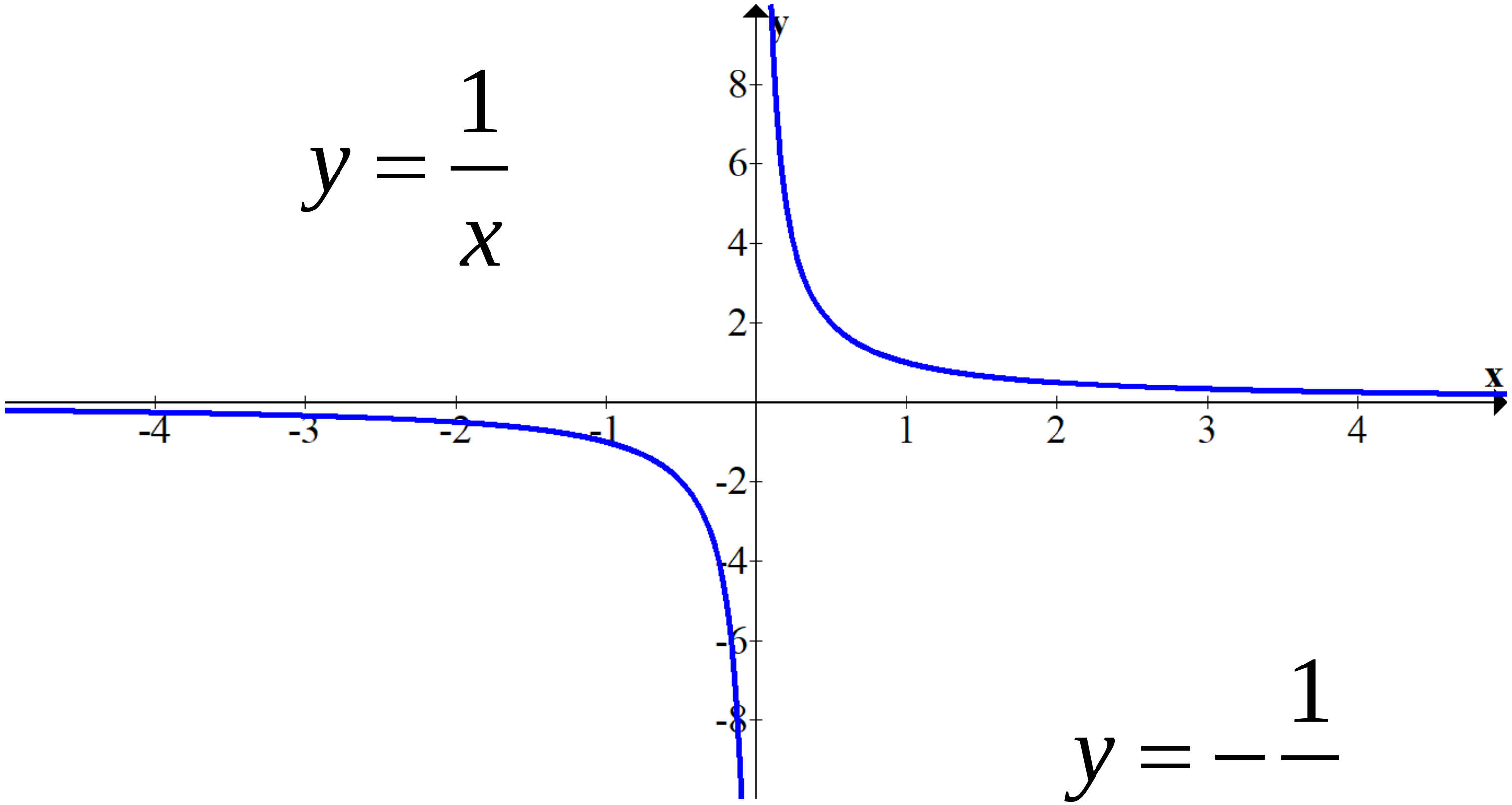
Calcule los siguientes límites:

$$\lim_{x\to 0^-}\left[\frac{1}{1-e^{-1/x}}\right]$$

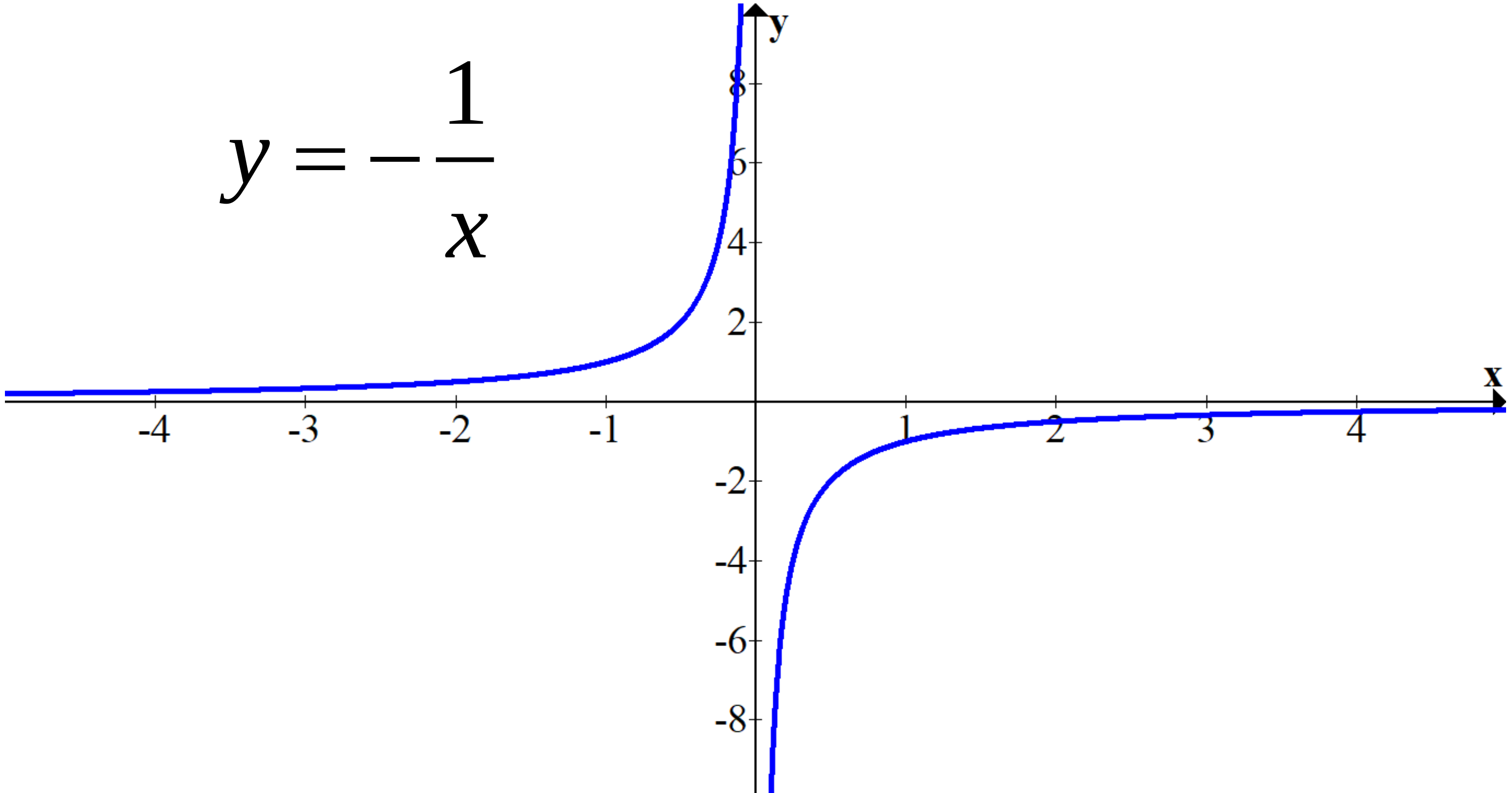
$$\lim_{x\to 0^+}\left[\frac{1}{1-e^{-1/x}}\right]$$

$$\lim_{x\to \infty}\left[\frac{1}{1-e^{-1/x}}\right]$$

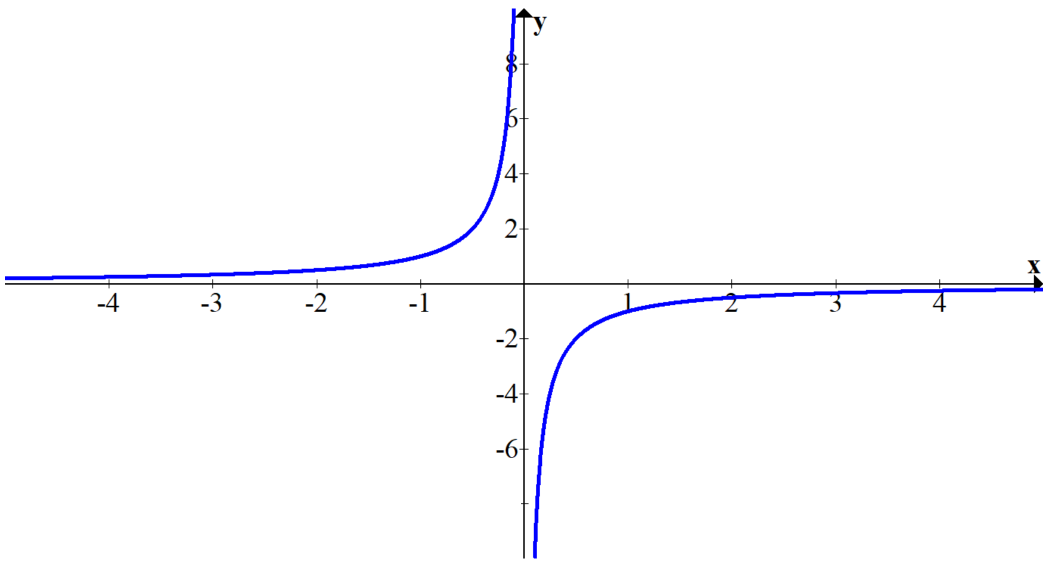
$$y = \frac{1}{x}$$

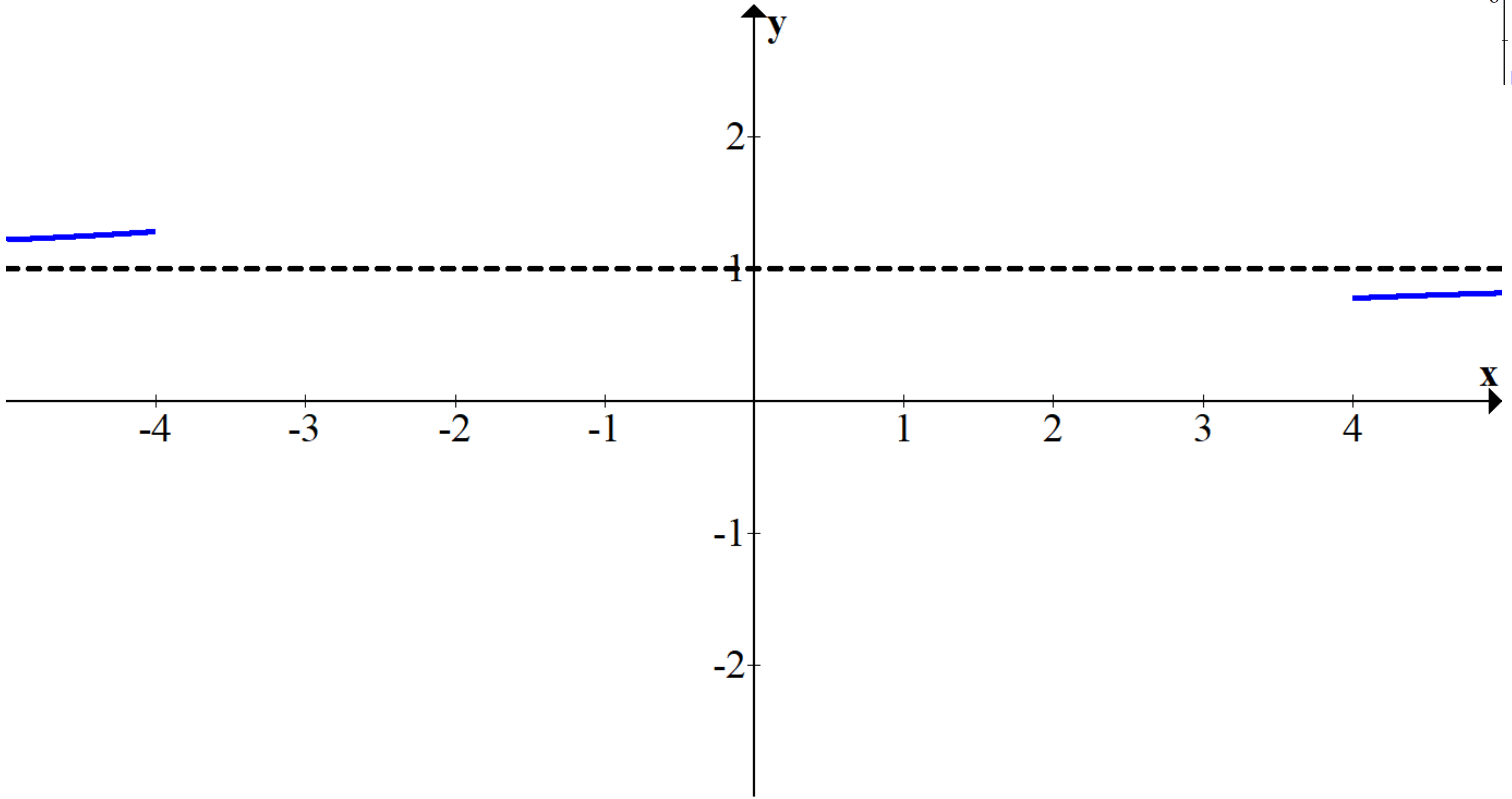


$$y = -\frac{1}{x}$$

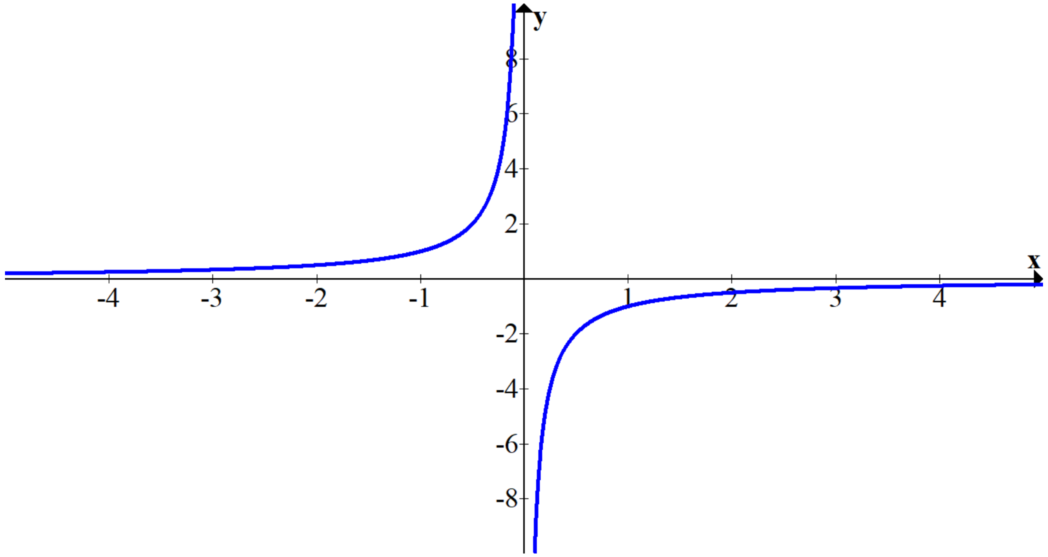


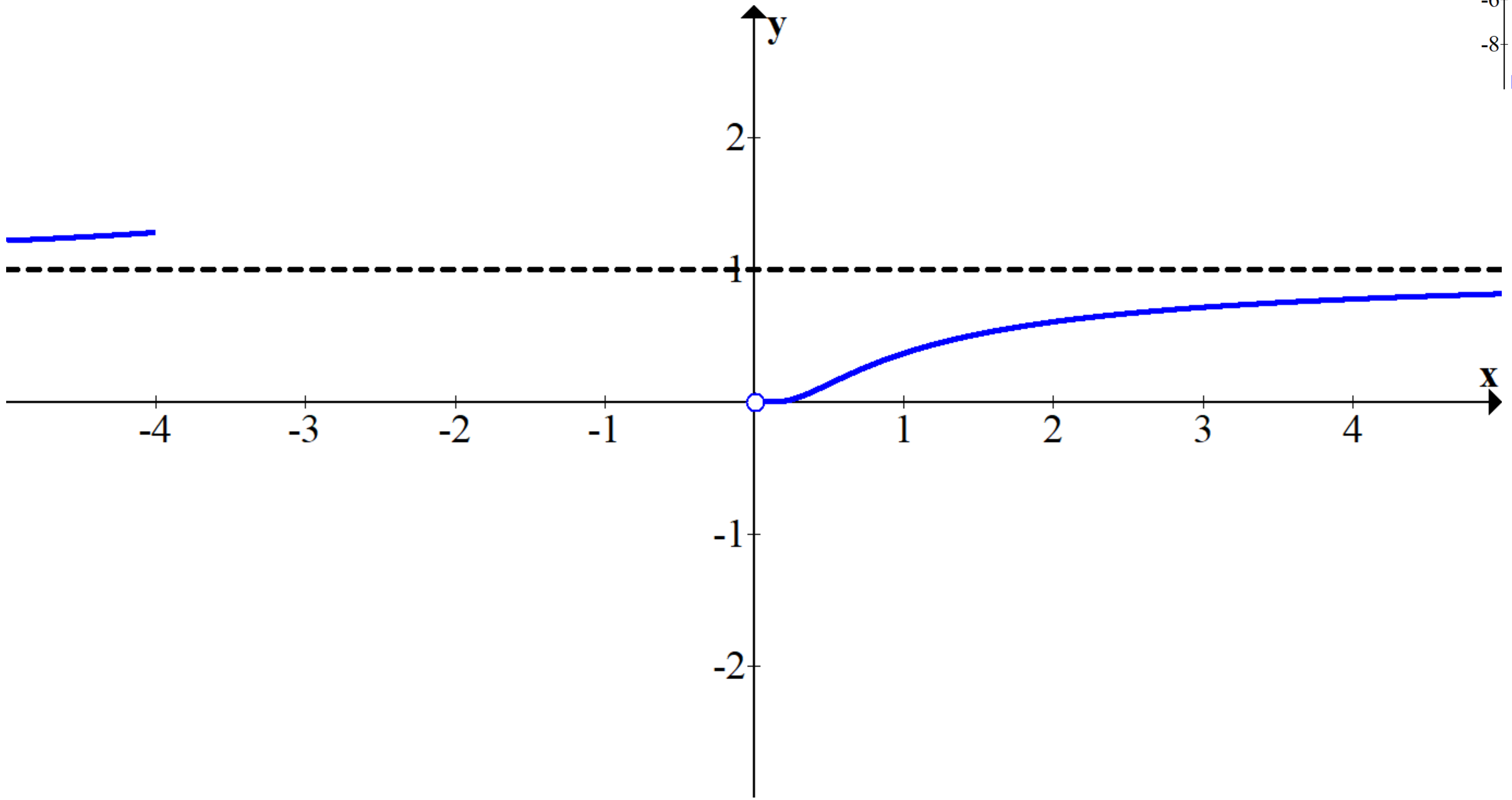
$$y_1 = e^{-1/x}$$



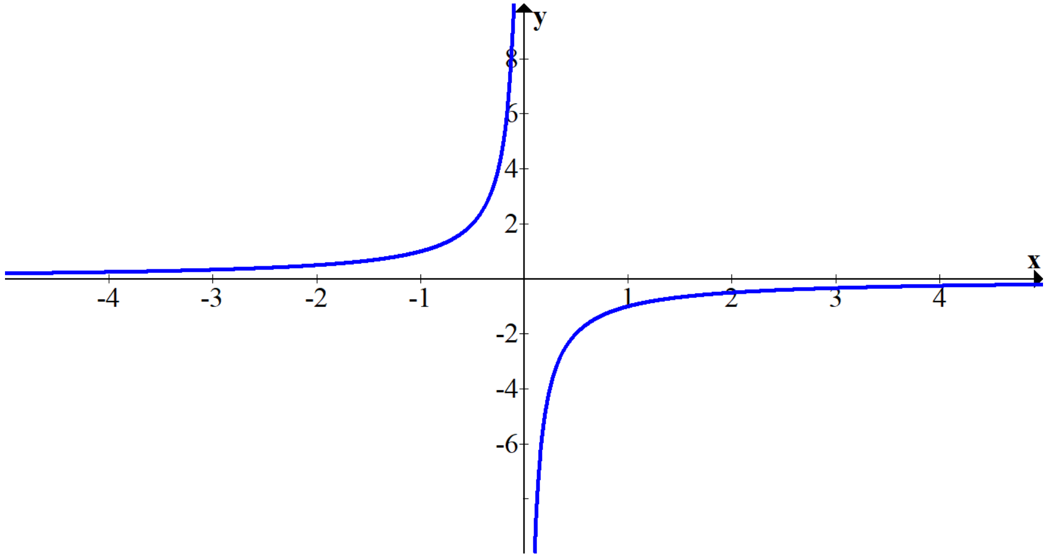


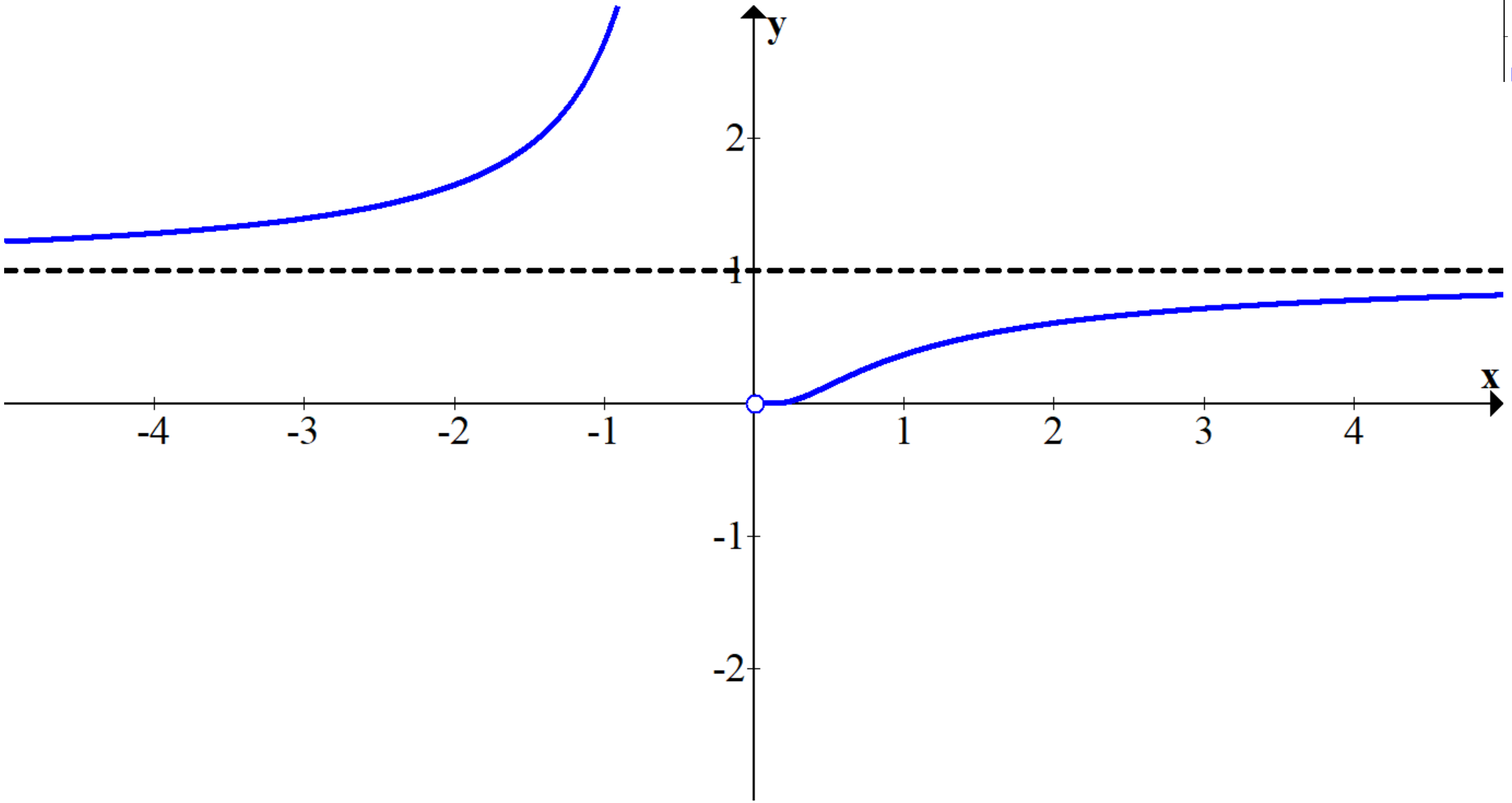
$$y_1 = e^{-1/x}$$



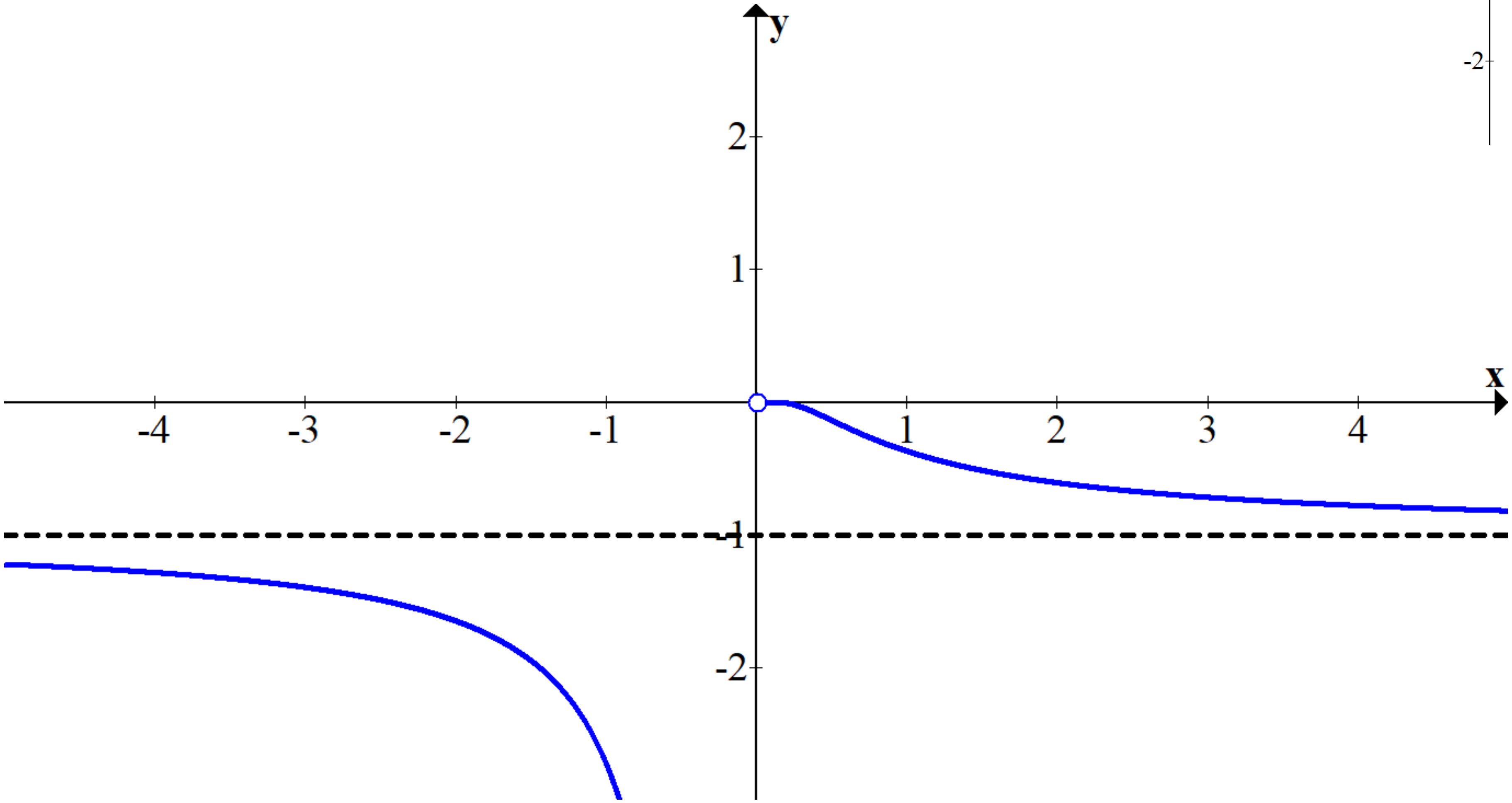


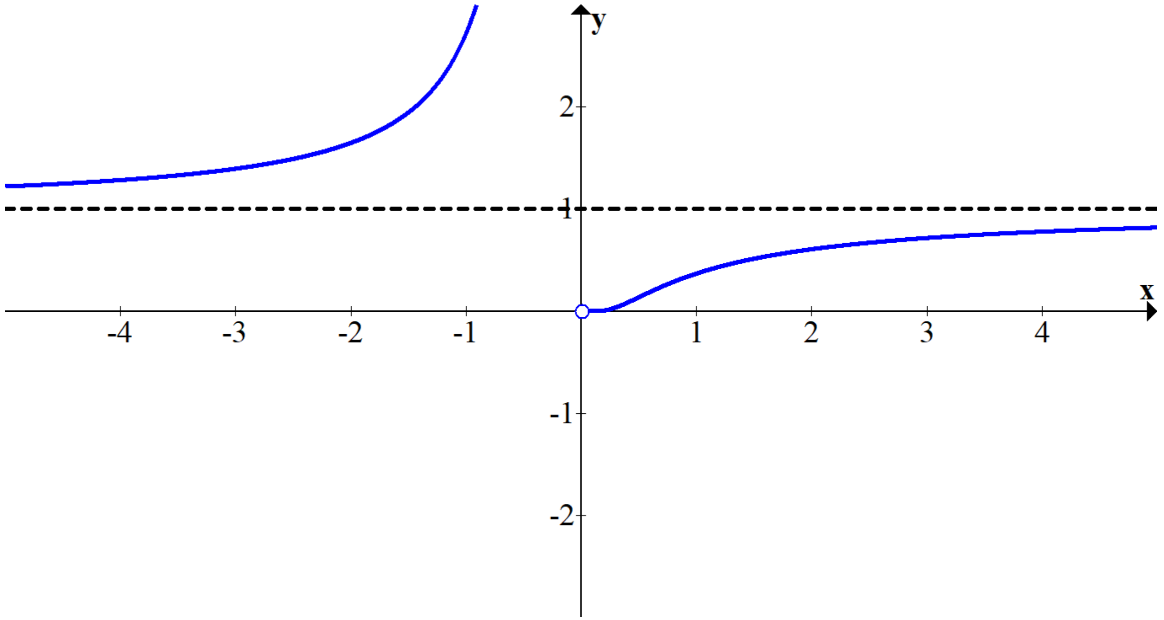
$$y_1 = e^{-1/x}$$



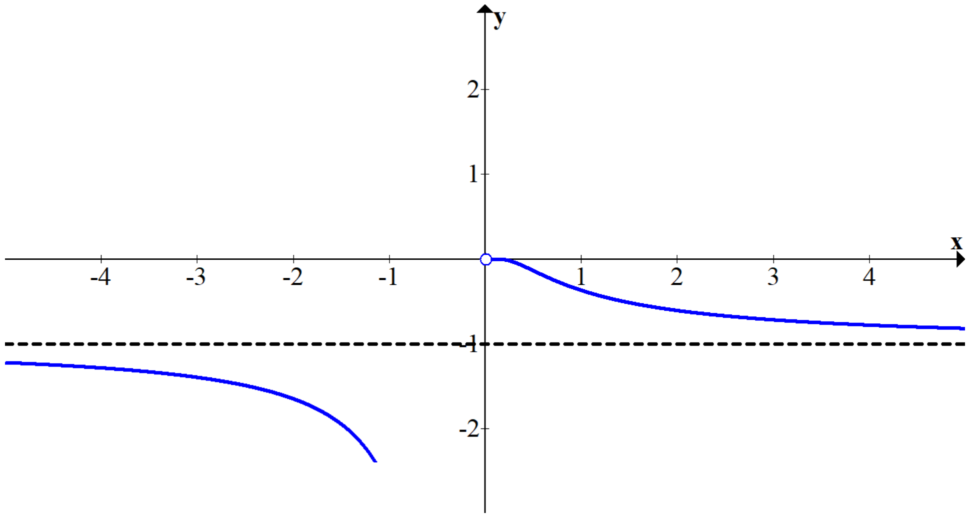


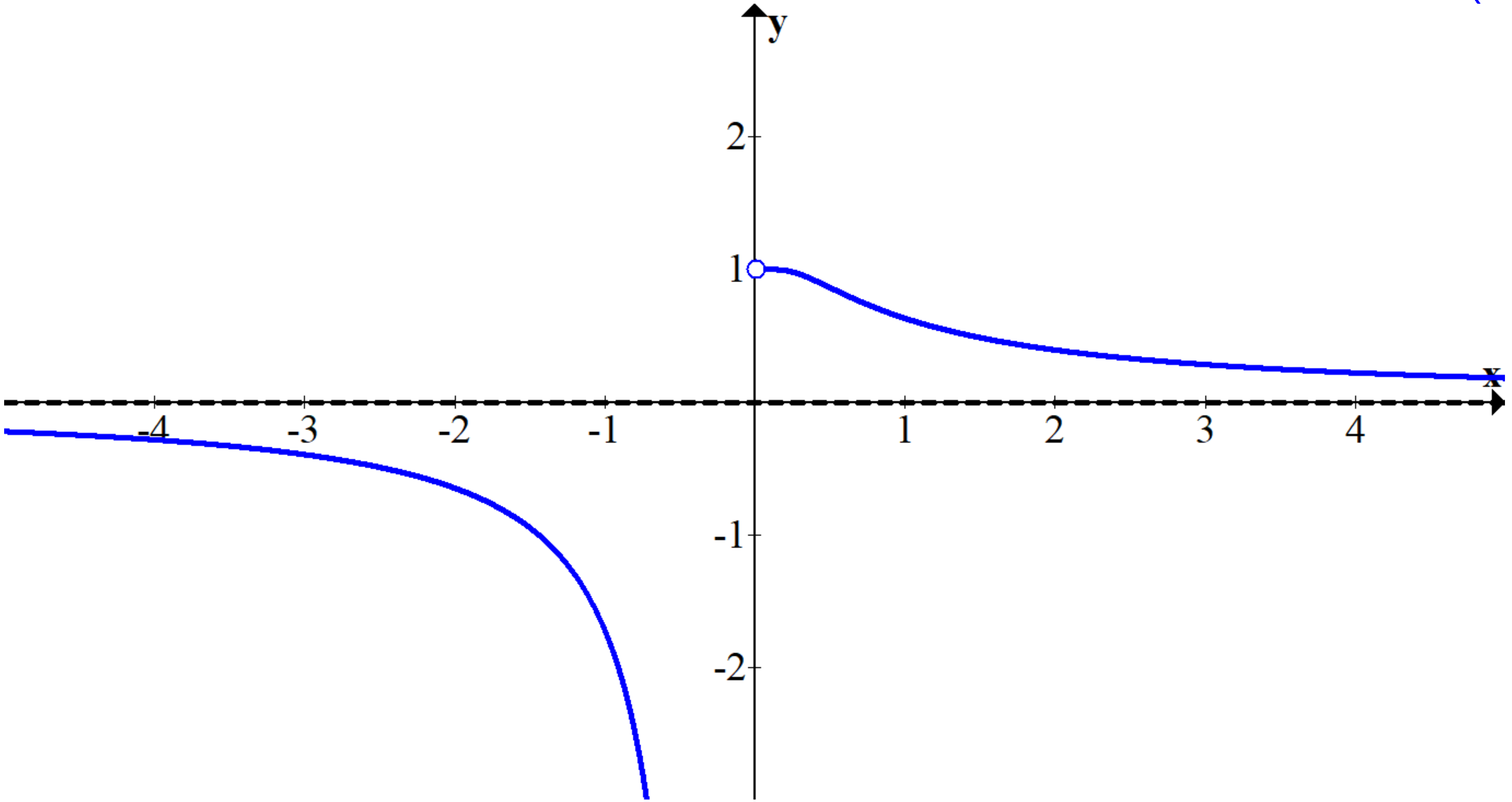
$$y_2 = -e^{-1/x}$$



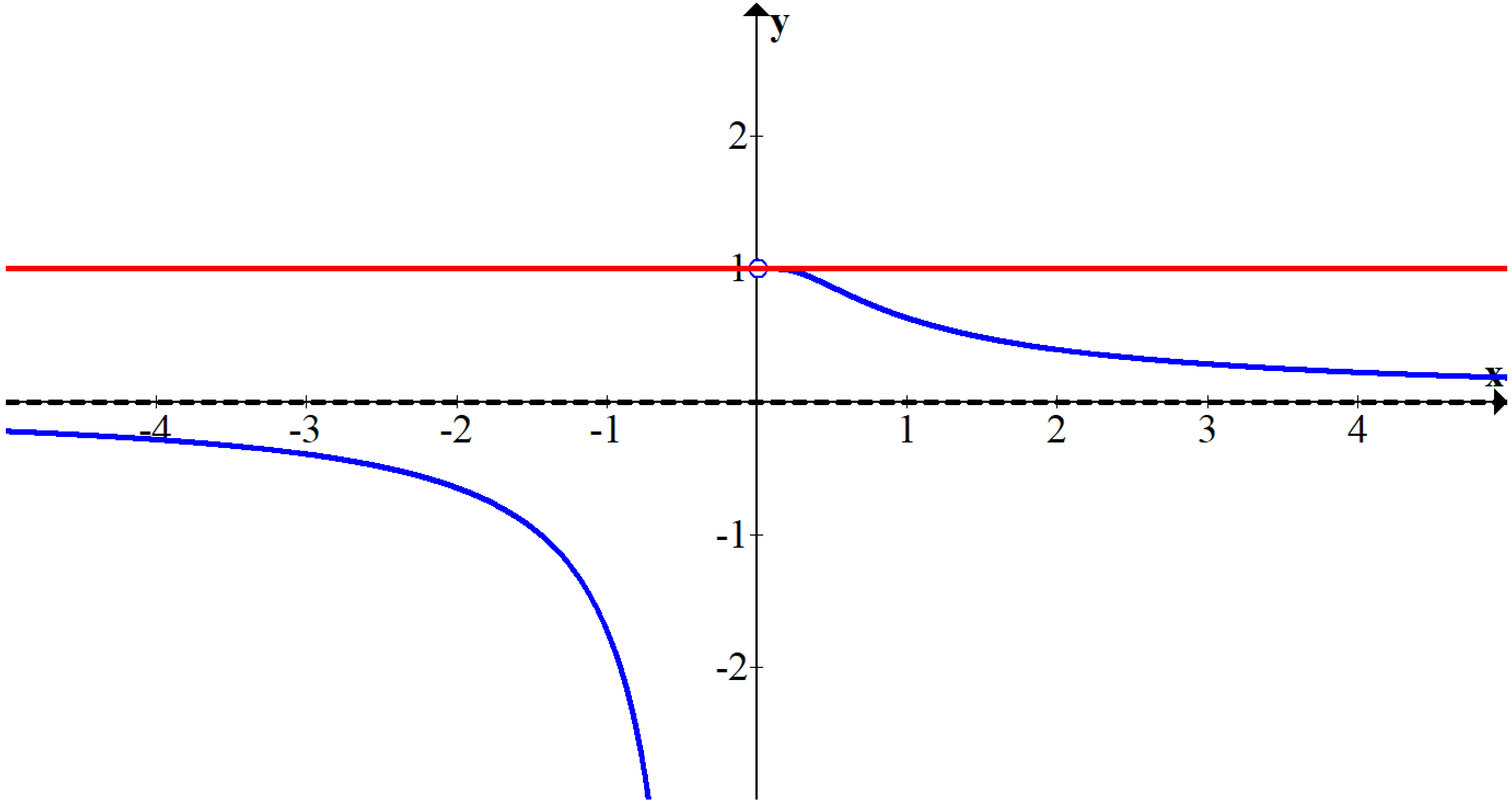


$$y_3 = 1 - e^{-1/x}$$

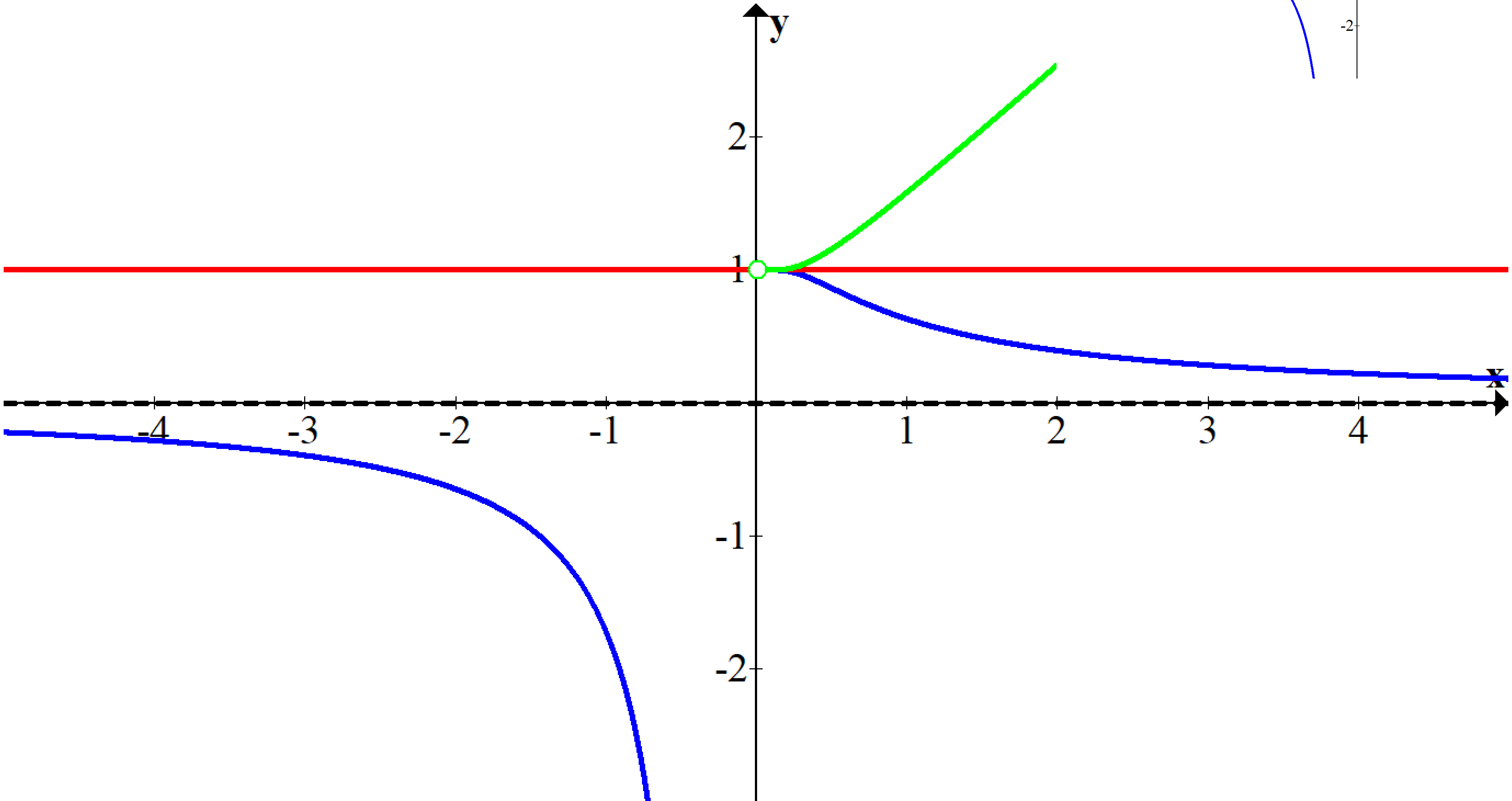


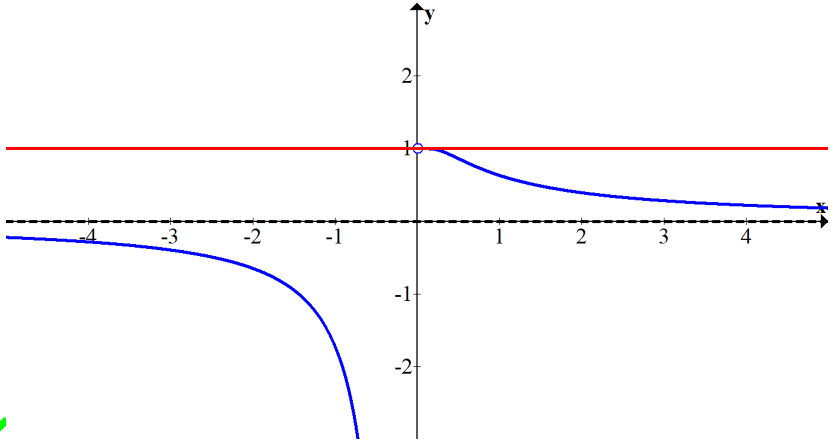


$$L(x)=\frac{1}{1-e^{-1/x}}=\frac{y_4}{y_3}$$

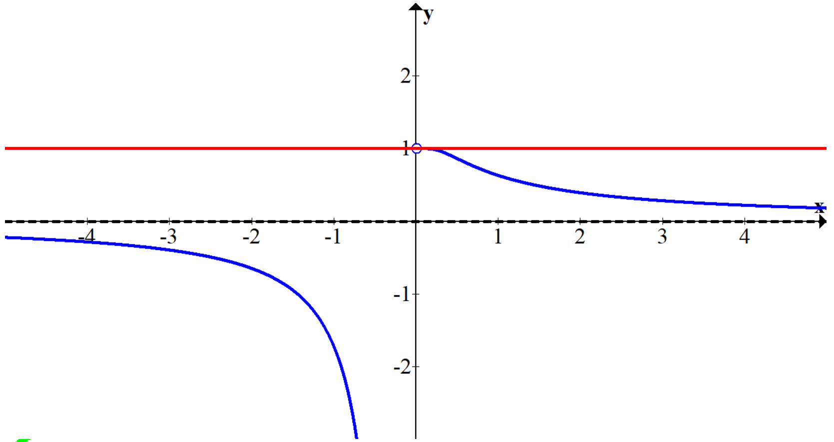


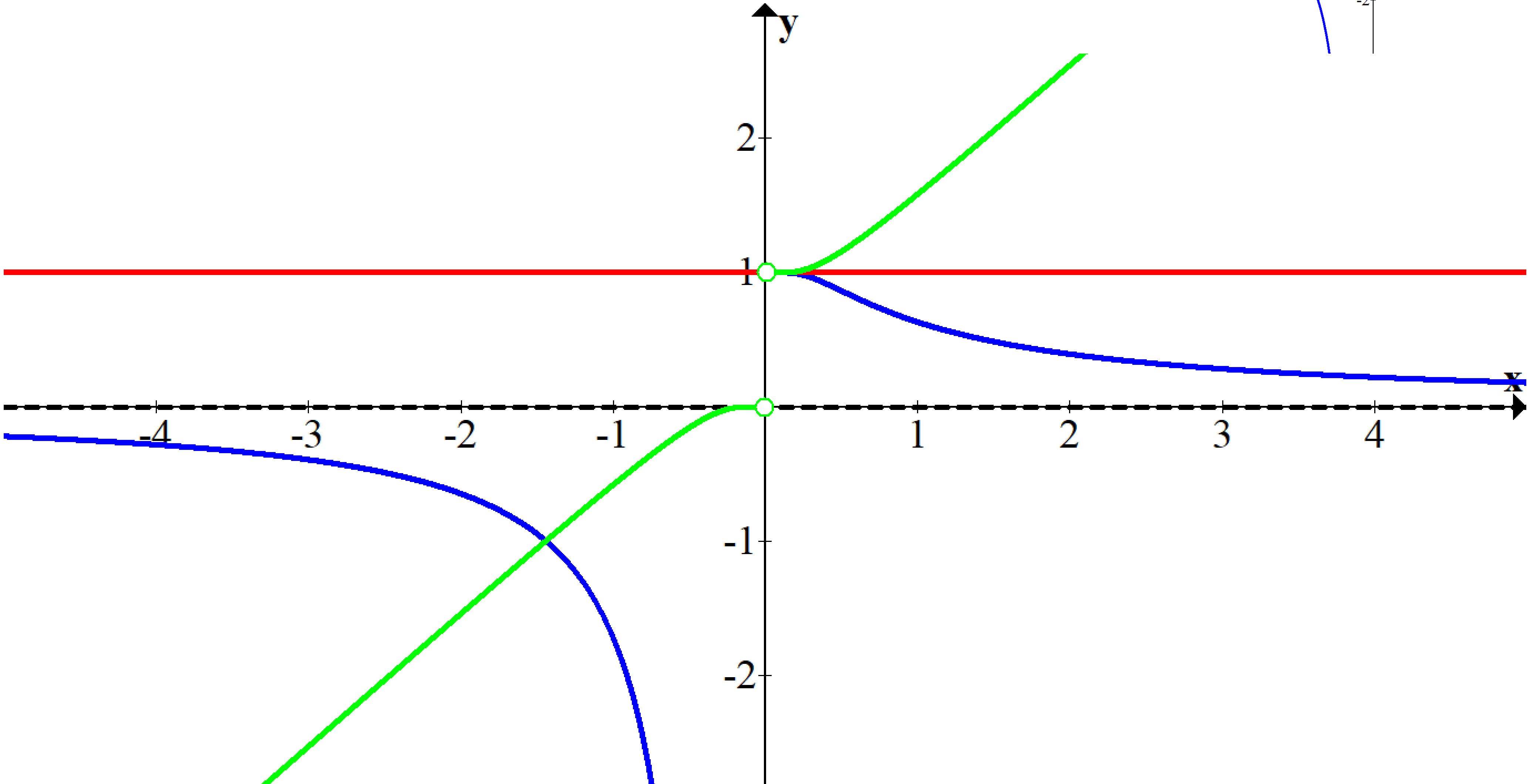
$$L(x) = \frac{1}{1-e^{-1/x}} = \frac{y_4}{y_3}$$



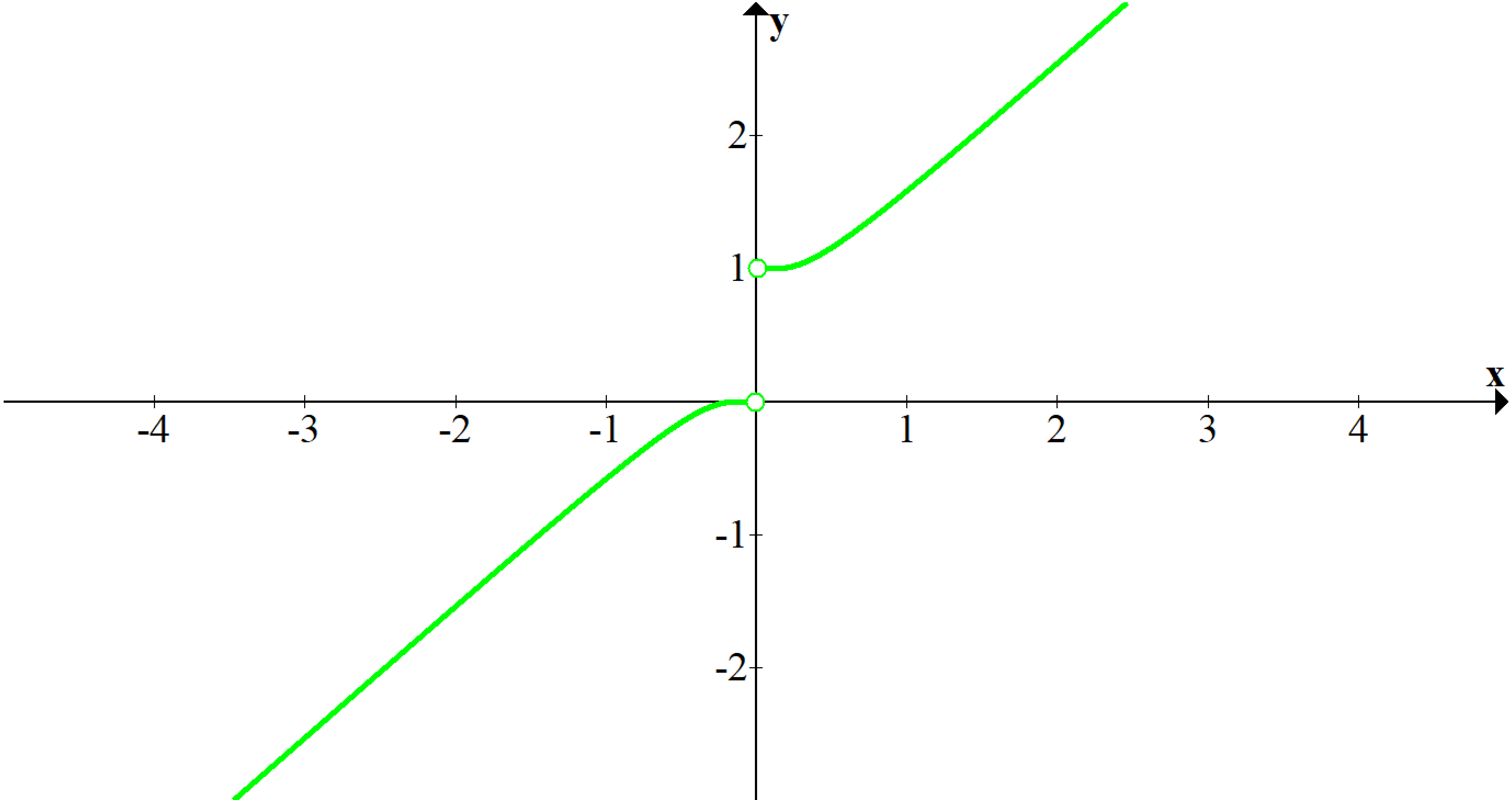


$$L(x) = \frac{1}{1-e^{-1/x}} = \frac{y_4}{y_3}$$





$$\lim_{x\to 0^-}\left[\frac{1}{1-e^{-1/x}}\right]=0 \quad \lim_{x\to 0^+}\left[\frac{1}{1-e^{-1/x}}\right]=1 \quad \lim_{x\to \infty}\left[\frac{1}{1-e^{-1/x}}\right]=\infty$$



¡Gracias por su atención!

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