Notes - 3.5 Limits at infinity

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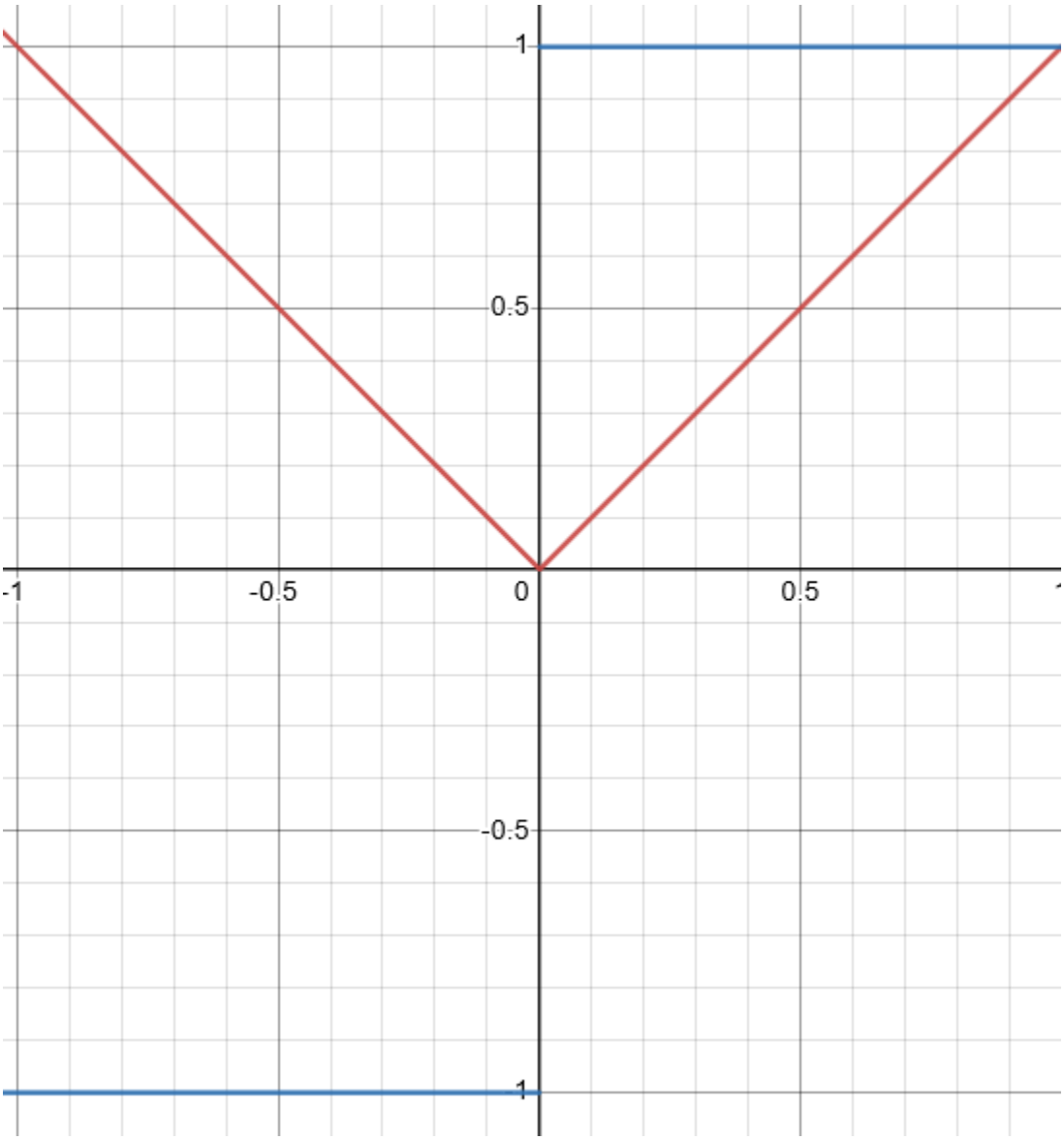
1 Sketch the derivative of $|x|$



Let

$$f(x) = \frac{g(x)}{d(x)} = q(x) + \frac{r(x)}{d(x)}$$

where $q(x)$ is the quotient of $\frac{g(x)}{d(x)}$ and $r(x)$ the remainder.

There is a root at $g(x) = 0$

There is a vertical asymptote at $d(x) = 0$

There are holes when the function results in $\frac{0}{0}$

If r is a positive rational number and c is any real number, then
Notes - 3.6 A summary of curve sketching

2 BOBY0

B: Bigger

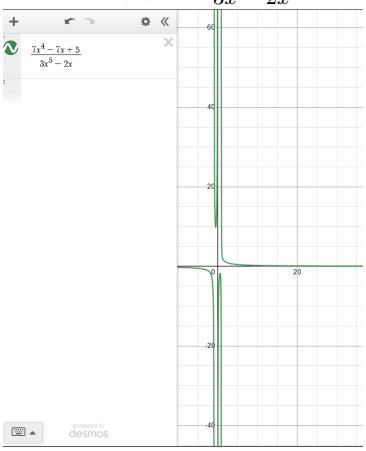
O: On

B: Bottom

Y: $Y = 0$

0: Zero

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



The degree on the bottom (the $3x^5$ is fifth-degree); therefore, $y = 0$ is the end behavior asymptote.

3 BOTN0

B: Bigger

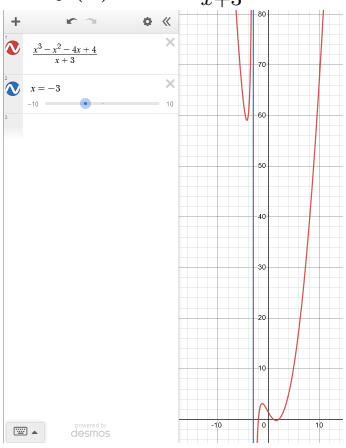
O: On

B: Top

Y: No (horizontal asymptote)

0: Zero

Let $f(x) = \frac{x^3-x^2-4x-4}{x+3} = x^2 - 4x + 8 - \frac{20}{x+3}$



$q(x) = x^2 - 4x + 8$ is the oblique asymptote, and $r(x) = -\frac{20}{x+3}$ is the remainder.

4 EATSDC

E: Exponents

A: Are

T: The

S: Same

D: Divide

C: Coefficients

Let $f(x) = \frac{7x^4-7x+5}{2x^4-2}$. Dividing coefficients (7 and 2) yields $y = \frac{7}{2}$.