MATH180 - REC NOTES
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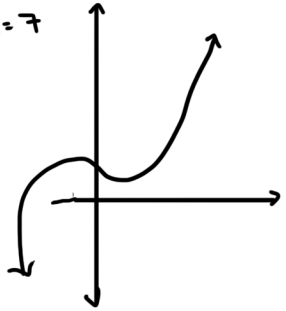
Questions from 2.1 (2.2 extension due to professor absence)

Type 4. prob. 3:

$\lim_{x \to 1} f(x) = 7$

Substitution



$\lim_{x \to 1} g(x) = 4$

$\lim_{x \to 1} (5f(x) + g(x))$

$\lim_{x \to 1} 5f(x) + \lim_{x \to 1} g(x)$

$5(\lim_{x \to 1} f(x)) + 4$

$f(x) = -7$

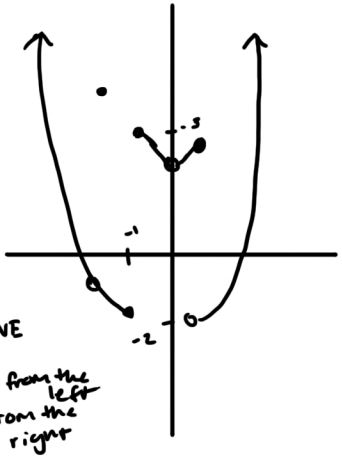
$g(x) = 4$

$-35 + 4$

-31

Section 5 type 2:

In order for a limit to exist, it must approach both sides.



from the right

$\lim_{x \to 0^+} f(x) = 2$

$\lim_{x \to 0^-} f(x) = 2$

from the left

$\lim_{x \to -1^-} f(x) = \text{DNE}$

negative → from the left

positive - from the right

Math channel: 3blue1brown

$$\frac{3p^2+15p+18}{9p^2-27p-90}$$ (factor and simplify)

$9p^2-27p-90$ (divisible by 9)

$9(p^2-3p-10)$

$p \cdot p$ and $-5 \cdot 2$; $-5p + 2p = -3p$

$(p-5)(p+2)$

$3p^2+15p+18$ (divisible by 3)

$3(p^2+5p+6)$

$p \cdot 2 = 2p$, $p \cdot 3 = 3p$; $2p + 3p = 5p$

$3(p+2)(p+3)$

$$\frac{3(p+2)(p+3)}{9(p-5)(p+2)}$$

$$\frac{p+3}{3(p-5)}$$

$$\lim_{x \to 7} \frac{x^2-4x-21}{x-7}$$

$$\frac{(7)^2-4(7)-21}{(7)-7}$$ (can't divide by 0)

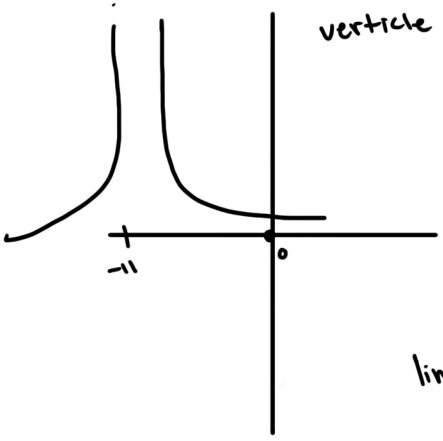
$$\frac{(x-7)(x+3)}{x-7}$$

$$\lim_{x \to 7} (x+3) = (7)+3 = 10$$

Type 4, problem 5

$\lim_{x \to -11} f(x)$

$$f(x) = \begin{cases} \frac{4x}{x+11} & \text{if } x < 0 \\ \frac{4x}{x-11} & \text{if } x \geq 0 \end{cases}$$



vertical asymptote = -11

$$\lim_{-11} \frac{\frac{4x}{x}}{\frac{x+11}{x}} = \lim_{-11} \frac{4}{1+\frac{11}{x}} = \frac{4}{0}$$

if divide by 0,
$= \infty$