3.1 day 2 lesson

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Find the slope between...

① $f(4)=6$ and $f(-2)=11$ $\quad m=\frac{y_2-y_1}{x_2-x_1}$

$(4,6)$ and $(-2,11)$

$m=\frac{-5}{6}$

② $f(-3)=-5$ and $f(0)=8$

$(-3,-5)$ $\quad (0,8)$

$m=\frac{8+5}{0+3}=\frac{13}{3}$

③ Write the equation of the line between $y=mx+b$

$f(0)=4$ and $f(-3)=5$.

$(0,4)$ $\quad (-3,5)$

$m=\frac{5-4}{-3-0}=\frac{1}{-3}$

$y=-\frac{1}{3}x+4$

④ Let $g(x)=8+2x$.

Calculate the slope between $g(3)$ and $g(3+h)$.

$g(3)=8+2\cdot 3=14$ $\quad (3,14)$ $\quad (3+h,14+2h)$

$g(3+h)=8+2(3+h)$

$=8+6+2h$

$=14+2h$

$m=\frac{14+2h-14}{3+h-3}=\frac{2h}{h}=2$

⑤ Let $f(x)=x^2-4$

Calculate the slope between $f(5)$ and $f(5+h)$

$f(5) = 5^2 - 4$

$= 21$

$f(5+h) = (5+h)^2 - 4$

$= 25 + 10h + h^2 - 4$

$= h^2 + 10h + 21$

$(5, 21)$ & $(5+h, h^2+10h+21)$

$$m = \frac{h^2+10h+21-21}{5+h-5}$$

$$= \frac{h^2+10h}{h} = \frac{h(h+10)}{h} = h+10$$

Domain of functions

Find the domain of the functions below in interval notation:

A. $g(x) = x^2 - 4x$

$(-\infty, \infty)$

B. $h(x) = 3x^3 - 8x^2$

$(-\infty, \infty)$

C. $m(x) = \sqrt{x+4}$

$x + 4 \geq 0$

$x \geq -4$

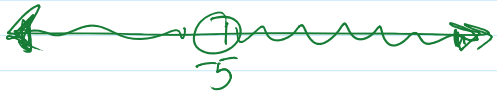
$[-4, \infty)$

D. $g(x) = \frac{7+8x}{x+5}$

$x + 5 \neq 0$

$x \neq -5$

$(-\infty, -5) \cup (-5, \infty)$



E. $p(x) = \frac{3+8x}{2x-11}$

F. $a(x) = |7 + 3x|$

E. $p(x) = \frac{3+8x}{2x-4}$

$(-\infty, 2) \cup (2, \infty)$

F. $a(x) = |7 + 3x|$

$(-\infty, \infty)$

G. $t(x) = \sqrt{5 - x}$

$(-\infty, 5]$

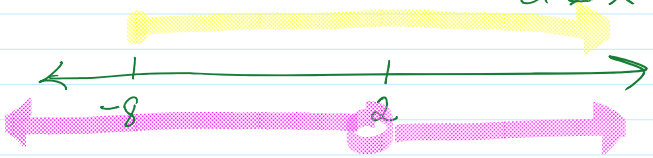
H. $crazy(x) = \frac{\sqrt{x+8}}{2-x}$

$x + 8 \geq 0$

$x \geq -8$

$2 - x \neq 0$

$2 \neq x$



$[-8, 2) \cup (2, \infty)$

PERFORMANCE TASK:

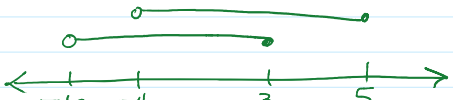
Is $y^3 - 3|x| = 7$ a function?

Explain how you know.

Simplify:

① $(-2, 4) \cup (0, 6)$

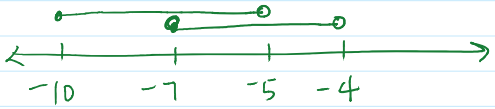
$(-2, 6)$



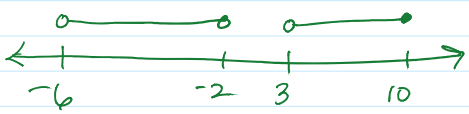
② $(-6, 3] \cap (-4, 5] = (-4, 3)$

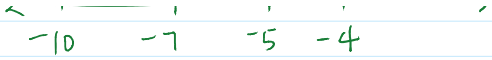
$(-6, 3] \cup (-4, 5] = (-6, 5]$

③ $[-10, -5) \cap (-7, -4)$

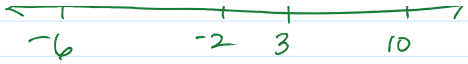


④ $(-6, -2) \cap (3, 10]$





$(-7, -5)$



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