

Tuesday, October 23, 2018
1:39 PM

Precalc – Chapter 1 Review Do Now

Name KEY

1. Give the domain of a) $f(x) = \frac{x+3}{x+1}$ b) $g(x) = \frac{x+1}{x+5}$ (use interval notation).

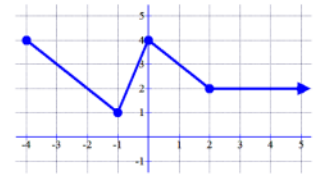
a) $x+3 \geq 0$ } $x+1 \neq 0$
 $x \geq -3$ } $x \neq -1$
 must be pos
 cant $\neq 0$

$[-3, -1) \cup (-1, \infty)$

b) $x+3 > 0$
 $x > -3$
 must be pos, $\neq 0$

$(-3, \infty)$

2. Give the domain and range of the relation, as well as any increasing, decreasing, and constant intervals using the diagram at the right. Use interval notation.



D: $[-4, \infty)$ R: $[1, 4]$
 increasing: $(-1, 0)$
 Decreasing: $(-4, -1) \cup (0, 2)$ constant: $(2, \infty)$

3. For the function $f(x) = -x^2 - 2x + 9$, find the difference quotient $\frac{f(x+h) - f(x)}{h}$, $h \neq 0$

$$\begin{aligned} f(x+h) &= -(x+h)^2 - 2(x+h) + 9 \\ &= -(x+h)(x+h) - 2x - 2h + 9 \\ &= -(x^2 + 2xh + h^2) - 2x - 2h + 9 \\ &= -x^2 - 2xh - h^2 - 2x - 2h + 9 \end{aligned}$$

$$\begin{aligned} \text{Diff. Quot.: } & \frac{-x^2 - 2xh - h^2 - 2x - 2h + 9 + x^2 + 2x - 9}{h} \\ &= \frac{-2xh - h^2 - 2h}{h} = \frac{h(-2x - h - 2)}{h} = \boxed{-2x - h - 2} \\ & \quad h \neq 0 \end{aligned}$$

4. If $f(x) = \begin{cases} -x-3 & \text{if } x \leq -2 \\ x^2+1 & \text{if } x > -2 \end{cases}$, $g(x) = \lfloor x+3 \rfloor$, and $h(x) = 4|x-3|$

find a) $f\left(-\frac{5}{2}\right)$

$$\begin{aligned} &= -\left(-\frac{5}{2}\right) - 3 \\ &= \frac{5}{2} - 3 \\ &= \boxed{-\frac{1}{2}} \end{aligned}$$

b) $h\left(-\frac{1}{2}\right)$

$$\begin{aligned} &= 4\left|-\frac{1}{2}-3\right| \\ &= 4|-3.5| \\ &= 4(3.5) \\ &= \boxed{14} \end{aligned}$$

c) $f\left(g\left(-\frac{5}{2}\right)\right)$

$$\begin{aligned} g\left(-\frac{5}{2}\right) &= \lfloor -\frac{5}{2} + 3 \rfloor \\ &= \lfloor \frac{1}{2} \rfloor = 0 \\ f(0) &= (0)^2 + 1 \\ &= \boxed{1} \end{aligned}$$