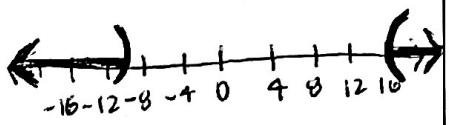
Math 1050 PRACTICE Quiz (1.6-3.3)

1. Solve the following inequality and state the solution in interval notation AND graph your solution.

$$5-|3-x|<-8$$
$$-5 \qquad -5$$
$$-|3-x|<-13$$
$$\frac{-|3-x|}{-1} < \frac{-13}{-1}$$
$$|3-x|>13$$



$3-x<-13$ or $3-x>13$

$-3 \quad -3$ $\quad -3 \quad -3$

$-x<-16$ $\quad -x>10$

$x>16$ or $x<-10$

2. Find the domain of: $f(x)=\frac{x+1}{\sqrt{x+4}}$

$\{x \mid x>-4\}$

3. State the Domain and Range for the relation. Then determine whether the relation is a function.

$\{(-1,-1),(0,0),(-1,1)\}$

D: $\{-1,0\}$
R: $\{-1,0,1\}$
not a function

4. Let $f(x)=\frac{x-5}{x+3}$ and $g(x)=\frac{7}{x-5}$.

a) Find and simplify $(f \cdot g)(x)$.

$$\frac{x-5}{x+3} \cdot \frac{7}{x-5} = \frac{7}{x+3}$$

b) Find and state the domain of $(f \cdot g)(x)$ in set notation.

$\{x \mid x \neq -3, 5\}$

5. Find the difference quotient $DQ = \frac{f(x+h)-f(x)}{h}$ for both of the following functions below. ONLY simplify ONE of your choosing.

a) $f(x) = \sqrt{x-7}$

$$\frac{\sqrt{(x+h)-7} - \sqrt{x-7}}{h} \cdot \frac{(\sqrt{x+h-7} + \sqrt{x-7})}{(\sqrt{x+h-7} + \sqrt{x-7})} = \frac{(\sqrt{x+h-7})^2 - (\sqrt{x-7})^2}{h(\sqrt{x+h-7} + \sqrt{x-7})}$$

$$\frac{x+h-7-x+7}{h(\sqrt{x+h-7} + \sqrt{x-7})} = \frac{h}{h(\sqrt{x+h-7} + \sqrt{x-7})} = \boxed{\frac{1}{\sqrt{x+h-7} + \sqrt{x-7}}}$$

b) $f(x) = \frac{1}{x+5}$

$$\frac{\frac{(x+5)}{(x+5)}\frac{1}{x+h+5} - \frac{1}{x+5}\frac{(x+h+5)}{(x+h+5)}}{h} = \frac{\frac{x+5}{(x+5)(x+h+5)} - \frac{x+h+5}{(x+5)(x+h+5)}}{h}$$

$$\frac{\frac{x+5-x-h-5}{(x+5)(x+h+5)}}{h} = \frac{\frac{-h}{(x+5)(x+h+5)}}{h} = \frac{-h}{(x+5)(x+h+5)} \cdot \frac{1}{h} = \boxed{\frac{-1}{(x+5)(x+h+5)}}$$

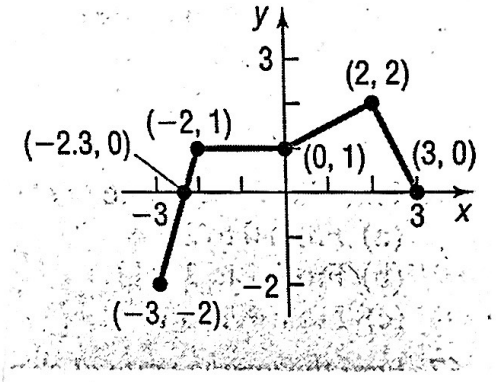
6. Determine algebraically whether the function is even, odd, or neither.

$$g(x) = \frac{x^3}{x^2+1}$$

$$g(-x) = \frac{(-x)^3}{(-x)^2+1} = \frac{-x^3}{x^2+1} = -g(x)$$

odd

7. Identify the increasing and decreasing intervals on the graph below:



inc: $(-3,-2)$ and $(0,2)$

or

$-3 < x < -2$ and $0 < x < 2$

dec: $(2,3)$ or $2 < x < 3$