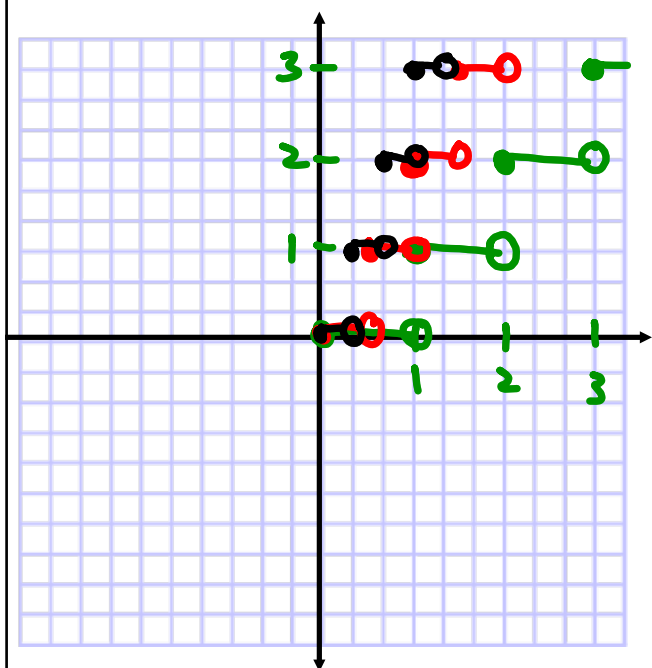


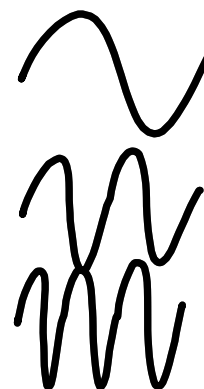
**93. Stretched Step Functions** Sketch graphs of the functions  $f(x) = \llbracket x \rrbracket$ ,  $g(x) = \llbracket 2x \rrbracket$ , and  $h(x) = \llbracket 3x \rrbracket$  on separate graphs. How are the graphs related? If  $n$  is a positive integer, what does the graph of  $k(x) = \llbracket nx \rrbracket$  look like?



$\sin x$

$\sin 2x$

$\sin 3x$



26. If  $x < 0$ , then  $-|x| =$

(A)  $-x$

(B)  $-\frac{1}{x}$

(C)  $0$

(D)  $\frac{1}{x}$

(E)  $x$

$$|x| = \begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}$$

$-(-x)$   
 $= x$

30. A taxi charges a base fee of \$1.25 plus \$0.75 for each mile (or part thereof). Which of the following would represent the taxi fare for a trip of length  $x$  miles? (Let  $\lceil x \rceil$  represent the least integer that is greater than or equal to  $x$ .)

(A)  $\$2.00\lceil x \rceil$

(B)  $\$1.25 + \$0.75\lceil x \rceil$

(C)  $\$0.75 + \$1.25\lceil x \rceil$

(D)  $\$1.25 + \$0.75\lceil x + 1 \rceil$

(E)  $\$0.75 + \$1.25\lceil x + 1 \rceil$

$$\lceil 1.5 \rceil = 2$$

$$1.25 \rightarrow 0 \quad 1$$
$$\lceil 1.1 \rceil \rightarrow 1.25 + .15$$

1. Let  $[x]$  denote the greatest integer  $n$  such that  $n \leq x$ . Let (9%)  $f(x) = [x/12\frac{1}{2}] \cdot [-12\frac{1}{2}/x]$ . If  $0 < x < 90$ , then the range of  $f$  consists of  $k$  elements. Find the value of  $k$ .

$$(0, 12.5) \mid (12.5, 25) \mid (25, 37.5)$$

$$[x/12.5] \quad 0 \quad 1 \quad 2 \quad \dots \quad 7$$

$$[-12.5/x]$$

$$\begin{array}{c} \nearrow -1 \\ \searrow 0 \end{array}$$

$$(-1)$$

$$y = \frac{-12.5}{x}$$

