Piecewise functions
PreCalc RH

SAT II

12. What are all values of y that satisfy the inequality $-y|y| < -y|-y|$?

(A) 0 only
(B) All negative real numbers
(C) All positive real numbers
(D) All real numbers
(E) No real numbers

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

(A) $-x$
(B) $-\frac{1}{x}$
(C) 0
(D) $\frac{1}{x}$
(E) 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) $\$0.75 + \$1.25\lceil x + 1 \rceil$

31. What is the range of the function defined by $f(x) = \begin{cases} x^{\frac{1}{3}}, & x > 2 \\ 2x - 1, & x \le 2 \end{cases}$?

(A) $y > 2^{\frac{1}{3}}$
(B) $y \le 3$
(C) $2^{\frac{1}{3}} < y < 3$
(D) $y \ge 3$
(E) All real numbers

32. If $f(x) = |5 - 3x|$, then $f(2) =$

(A) $f(-2)$
(B) $f(-1)$
(C) $f(1)$
(D) $f\left(\frac{4}{3}\right)$
(E) $f\left(\frac{7}{3}\right)$

48. If $f(x) = \begin{cases} x & \text{when } 0 \le x < 1 \\ f(x-1) & \text{when } x \ge 1 \end{cases}$, what is the value of $f(4.7)$?

(A) 4.7
(B) 3.7
(C) 0.7
(D) 0.3
(E) −0.3

From competition math,

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

11. (55%) For every real number x, $[x]$ denotes the greatest integer less than or equal to x. Find all values of x in the interval $1 \leq x < 2$ that satisfy $[x]^2 = [x^2]$.

29. (68%) Let x be a nonintegral positive number and let $[x]$ denote the greatest integer n such that $n \leq x$. Find the value of $([x] + [-x])^5$.