

- (1) Is it true that between any two distinct real numbers there is a rational number? Why or why not?
- (2) What is the largest real number x such that $x < 1$?
- (3) Give the interval notation for the set of numbers determined by the following conditions.
- (a) $-1 \leq x \leq 2.5$
 - (b) $3 < x < 3.2$
 - (c) $x < 7$
 - (d) $x \geq 2.1$
 - (e) $|x - 2| < .1$
 - (f) $|x + 1| < .2$
 - (g) $|2.1 - x| < .05$
 - (h) $|2x - 1| < .3$

(4) Let

$$f(x) = \begin{cases} x & \text{if } -1 \leq x < 0 \\ 2 & \text{if } x = 0 \\ 1 - x & \text{if } x > 0. \end{cases}$$

(a) $f(-1) =$

(b) $f(0) =$

(c) $f(1.5) =$

(d) Graph the function.

(5) Write $h(x) = |x^2 - 4|$ in the form of “cases.” Graph it.

(6) Graph

(a) $y = \frac{1}{x}$

(b) $y = \frac{1}{x^2}$

(7) Find the straight lines satisfying each of the following conditions.

(a) slope $\frac{1}{2}$, through the point $(-1, 2)$.

(b) parallel to $x + 3y = 1$, through $(\frac{1}{2}, 1)$.

(c) perpendicular to $y = \frac{2}{5}x + 1$, through $(1, -2)$.

(d) through the points $(1, -2)$ and $(3, 1)$.