MATH3 (814013) – SPRING 2007

WORKSHEET 15

Question (1) : Write each of the following in inequality notation and graph on a real number line:

(1) $[-2,3)$

(2) $(0,4.5)$

(3) $(-\infty,3]$

(4) $[-4,-1]$

(5) $(2,\infty)$

Question (2) : Write each of the following in interval notation and graph on a real number line:

(1) $-3 < x \le 3$

(2) $2 \ge x \ge -1$

(3) $x > 1$

(4) $x \le 2$

(5) The set of real numbers less than 5.

(6) The set of real numbers between -1 and 4.

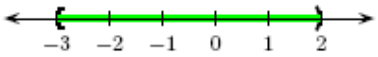
(7) The set of real numbers between -1 and 4 inclusive.

(8) The set of real numbers greater than or equal to -5 and less than 5.

Question (3) : Write in interval and inequality notation.

(1)

(2)



Question (4) : Graph the indicated sets and write as a single interval, if possible:

(1) $(-\infty,-2)\cap[-4,6)$

(2) $[-4,1]\cup(-\infty,0]$

(3) $\{\{0,1,2\}\cup\{2,3\}\}\cap(1,\infty)$

(4) $\{x / x \le 10\} \cap \{y / 6 < y \le 12\}$

(5) $(-\infty, \infty) \cap [-110, 695)$

(6) $(-\infty, -2) \cap \phi$

(7) $(-\infty, -2) \cap \phi$

(8) $(-\infty, -2) \cap \{-2\}$

(9) $(-\infty, -2) \cup \{-2\}$

(10) $(-\infty, -2) \cap \{2\}$

(11) $(-\infty, -2) \cap [4, 6)$

(12) $(-\infty, -2) \cup [4, 6)$

(13) $(-\infty, -2) \cap [-4, 6) \cap \{-2\}$

(14) $(-\infty, -2) \cap [-4, 6) \cap \{-3\}$

(15) $\{x / x \le 10, x \in N\} \cap \{y / 6 < y \le 12\}$

Question (5) : If $D = [-4, 1)$, $E = (-1, 3]$ and $F = [2, \infty)$, graph the indicated sets and write as a single interval, if possible:

(1) $D \cup E$

(2) $D \cap E$

(3) $E \cup F$

(4) $E \cap F$

(5) $D \cap E \cap F$

(6) $D \cup E \cup F$

(7) $(D \cup E) \cap F$

(8) $(D \cap E) \cup F$

Question (6) : Solve the following inequalities, graph the solution and write the answer in interval notation.

1) $3(2x-1)+4 \ge 4x-5$

2) $4x+4 < 2x-8$

3) $\frac{2x-3}{4} + \frac{1}{3} \le \frac{x}{2}$

4) $0.5x + 0.2(x-1) > 0.3x + 0.6$

5) $-3x \le 9$

6) $x(x-3)+5 \ge x^2-2x-3$

7) $3 \le -2x-3 < 5$

8) $4 > 7x-8 \le 6$

9) $8-3x \le 2x-7 < x-13$

10) $2x+3 < 3x+1 < x+9$

Question (7) : Indicate true (T) or false (F):

1) If $p > q$ and $m > 0$ then $mp < mq$.

2) If $p < q$ and $m < 0$ then $mp > mq$.

3) If $p > 0$ and $q < 0$ then $p+q > q$.

Question (8) : Assume that $m > n > 0$;then

$$mn > n^2$$
$$mn - m^2 > n^2 - m^2$$
$$m(n-m) > (n+m)(n-m)$$
$$m > n+m$$
$$0 > n$$

But it was assumed that $n > 0$. ***Find the error***.

Question (9) : What can be said about the signs of the numbers a and b in each case?

(1) $ab > 0$

(2) $ab < 0$

(3) $\frac{a}{b} > 0$

(4) $\frac{a}{b} < 0$