Review of Solving Inequalities and Interval Notation:

Single Inequalities: Goal: Get x on the left and a number on the right, if possible.

1. $x+8>4$

Subtract 8 on both sides. $\boxed{x>-4} \Rightarrow \boxed{(-4,\infty)}$

2. $8x<24$

Divide both sides by 8. $\boxed{x<3} \Rightarrow \boxed{(-\infty,3)}$

3. $3x \geq -36$

Divide both sides by 3. $\boxed{x \geq -12} \Rightarrow \boxed{[-12,\infty)}$

4. $5x+13\le 28$

Isolate x on the left by subtracting 13, then divide by 5. $5x\le 15 \Rightarrow \boxed{x\le 3} \Rightarrow \boxed{(-\infty,3]}$

5. $-2x>10$

Divide both sides by -2, and reverse the inequality direction. $\boxed{x<-5} \Rightarrow \boxed{(-\infty,-5)}$

6. $-3x\le -18$

Divide both sides by -3, and reverse the inequality direction. $\boxed{x\ge 6} \Rightarrow \boxed{[6,\infty)}$

7. $5>x$

Flip the inequality. $\boxed{x<5} \Rightarrow \boxed{(-\infty,5)}$

8. $2x-7<5x-9$

Isolate x on the left by subtracting $5x$ and adding 7. $-3x<-2 \Rightarrow \boxed{x>\frac{2}{3}} \Rightarrow \boxed{\left(\frac{2}{3},\infty\right)}$

9. $4(x-3)\geq 9(2x+7)$

Expand both sides. Isolate x on the left by subtracting $18x$ adding 12.

$4x-12\geq 18x+63 \Rightarrow -14x\geq 75 \Rightarrow \boxed{x\leq -\frac{75}{14}} \Rightarrow \boxed{\left(-\infty,-\frac{75}{14}\right]}$

10. $2x+7<2x+9$

Subtract $2x$ on both sides.

$7<9$ which is true for all values of x, so the solution is $\boxed{\text{all real numbers}} \Rightarrow \boxed{(-\infty,\infty)}$

11. $3(x-1) \geq 3x+9$

Expand the left side. Subtract $3x$ on both sides.

$3x-3 \geq 3x+9 \Rightarrow -3 \geq 9$ which is false for all values of x, so there is $\boxed{\text{no solution}}$.

Double Inequalities: Goal: Get x in the middle with smaller number on the left and larger number on the right, if possible.

1. $-2 < x < 10$ It's already solved.

$\boxed{-2 < x < 10} \Rightarrow \boxed{(-2,10)}$

2. $-6 < x + 6 \leq 8$

Subtract 6 on the left, right, and center. $\boxed{-12 < x \leq 2} \Rightarrow \boxed{(-12,2]}$

3. $1 \leq 3x + 4 < 19$

Isolate $3x$ in the middle, and then divide by 3. $-3 \leq 3x < 15 \Rightarrow \boxed{-1 \leq x < 5} \Rightarrow \boxed{[-1,5)}$

4. $5 \geq x \geq 1$

Flip the inequality. $\boxed{1 \leq x \leq 5} \Rightarrow \boxed{[1,5]}$

5. $-2 < -2x < 4$

Divide by -2, reverse the inequality directions, and then flip it.

$1 > x > -2 \Rightarrow \boxed{-2 < x < 1} \Rightarrow \boxed{(-2,1)}$

6. $3 < -3x \leq 6$

Divide by -3, and reverse the inequality directions, and then flip it.

$-1 > x \geq -2 \Rightarrow \boxed{-2 \leq x < -1} \Rightarrow \boxed{[-2,-1)}$

7. $-1 \leq -2x - 7 \leq 1$

Isolate $-2x$ in the middle by adding 7. Divide by -2, and reverse the inequalities, and then flip it. $6 \leq -2x \leq 8 \Rightarrow -3 \geq x \geq -4 \Rightarrow \boxed{-4 \leq x \leq -3} \Rightarrow \boxed{[-4,-3]}$

8. $-\frac{1}{2} < \frac{1}{4}x - 3 \le \frac{1}{2}$

Multiply by 4 to eliminate the fractions. Add 12.

$-2 < x - 12 \le 2 \Rightarrow \boxed{10 < x \le 14} \Rightarrow \boxed{(10,14]}$

9. $-3 < \frac{3x-6}{4} \le 6$

Multiply by 4, as before. Add 6 and divide by 3.

$-12 < 3x - 6 \le 24 \Rightarrow -6 < 3x \le 30 \Rightarrow \boxed{-2 < x \le 10} \Rightarrow \boxed{(-2,10]}$

10. $3 < x < -6$

There is $\boxed{\text{No solution}}$, since it's not possible for a number to be less than -6 and also greater than 3.