**MATH 123** **Inequalities**

Solve the following for x, y, or z, simplifying all answers completely. Express the solution using both inequality and interval notation. Shade the appropriate region on the number line.

**1.** $4(2x-3)-12x \le 0$

**2.** $5(3z-2) < 5$

**3.** $2-7(1-x) \ge 3(2-x)-5(x+3)$

**4.** $x^2 \le 9$

**5.** $\frac{7x+5}{8} - \frac{3x+15}{10} \ge 2$

**6.** $(2x+1)(4x-1) > 5$

**7.** $\frac{1}{2}x+3 < \frac{2}{3}$

**8.** $3(2x+5)-x \le 4(x-3)+7$

**9.** $(3x-2)(3x-4)(x-5) \le 0$

**10.** $(x+1) < 3(x+1)(2x-5)$

**11.** $x^2+2x \ge 3$

**12.** $\frac{5+3x}{2x-7} < \frac{2}{3}$

**13.** $\frac{x+7}{2x+5} > 5$

**14.** $\frac{6x}{5-x} \ge 3x$

**15.** $\frac{2x+5}{4-3x} > \frac{4}{9}$

**16.** $15x-3(x+6) \ge 6$

**17.** $\frac{6x}{5-2x} \le 5$

**18.** $3x+2 > 12-2x$

**19.** $2x^2 > x+15$

**20.** $3z-(5-2z) < 3 \le 13-2(2-2z)+z$

**21.** $-3(2x+4)-2 \ge -5(x-3)$

**22.** $-2(y+3)+3(2y-1) > 11$

**23.** $\frac{14x}{5-x} \le 7x$

**24.** $81x^4 < 16$

**25.** $\frac{2x}{7-x} > x$

**26.** $\frac{3}{8}x+\frac{1}{4} < \frac{1}{4}x+3$

**27.** $\frac{2-4z}{3+z} \le \frac{3}{7}$

**28.** $\left|\frac{2-3x}{5+x}\right| > 3$

**29.** $\left|\frac{x+3}{x-4}\right| \le \frac{3}{8}$

**30.** $\left|\frac{x+7}{4x+1}\right| \le \frac{4}{5}$