Compound Inequality Word Problems

Define a variable, write the compound inequality that represents the situation and solve. Finally, graph the solution.

The length of a rectangle is 20 meters longer than the width. The perimeter must be between 80 and 100 meters. What are the possible values for the width of the rectangle?

$$P = 2L + 2w$$

$$w = width$$

$$w + 20 = length$$

$$80 < 2w + 2(w+2) < 100 \quad \text{AND}$$

$$80 < 2w + 2w + 40 < 100$$

$$80 < 4w + 40 < 100$$
$$\quad -40 \quad -40 \quad -40$$

$$40 < 4w < 60$$
$$\quad \overline{4} \quad \overline{4} \quad \overline{4}$$

$$\boxed{10 < w < 15 \text{ meters}}$$

Alaina made a score of 76 on her midterm exam. In her course, the average of her midterm exam and final exam must be between 80 and 89 inclusive. What possible scores on the final exam would give Alaina a B in the course?

$x = score$ on final

$$80 \le x \le 89 \text{ (including 7 or 9)} \quad \text{AND}$$

$$2(80 \le \frac{76 + x}{2} \le 89)$$

$$160 \le 76 + x \le 178$$
$$\quad -76 \quad -76 \quad -76$$

$$84 \le x \le 102 \text{ score}$$