SYSTEMS OF THREE OR MORE INEQUALITIES You can also graph a system of three or more linear inequalities, as shown in Example 4.

EXAMPLE 4 TAKS REASONING: Multi-Step Problem

SHOPPING A discount shoe store is having a sale, as described in the advertisement shown.

- Use the information in the ad to write a system of inequalities for the regular footwear prices and possible sale prices.
- Graph the system of inequalities.
- Use the graph to estimate the range of possible sale prices for footwear that is regularly priced at $70.

Solution

STEP 1 **Write** a system of inequalities. Let x be the regular footwear price and let y be the sale price. From the information in the ad, you can write the following four inequalities.

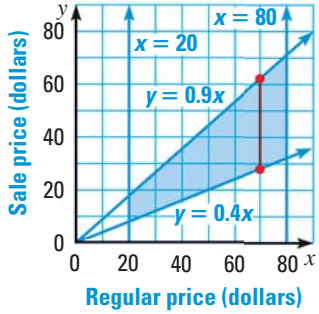
$x \geq 20$ **Regular price must be at least $20.**

$x \leq 80$ **Regular price can be at most $80.**

$y \geq 0.4x$ **Sale price is at least (100 − 60)% = 40% of regular price.**

$y \leq 0.9x$ **Sale price is at most (100 − 10)% = 90% of regular price.**

STEP 2 **Graph** each inequality in the system. Then identify the region that is common to all the graphs. It is the region that is shaded.



STEP 3 **Identify** the range of possible sale prices for $70 footwear. From the graph you can see that when $x = 70$, the value of y is between these values:

$0.4(70) = 28$ and $0.9(70) = 63$

So, the value of y satisfies $28 \leq y \leq 63$.

▶ Therefore, footwear regularly priced at $70 sells for between $28 and $63, inclusive, during the sale.

GUIDED PRACTICE for Example 4

7. **WHAT IF?** In Example 4, suppose the advertisement showed a range of discounts of 20%–50% and a range of regular prices of $40–$100.

a. Write and graph a system of inequalities for the regular footwear prices and possible sale prices.

b. Use the graph to estimate the range of possible sale prices for footwear that is regularly priced at $60.