A.CED.A.3: Modeling Linear Inequalities

1   An electronics store sells DVD players and cordless telephones. The store makes a $75 profit on the sale of each DVD player (d) and a $30 profit on the sale of each cordless telephone (c). The store wants to make a profit of at least $255.00 from its sales of DVD players and cordless phones. Which inequality describes this situation?
    1) $75d + 30c < 255$ 3) $75d + 30c > 255$
    2) $75d + 30c \leq 255$ 4) $75d + 30c \geq 255$

2   Joy wants to buy strawberries and raspberries to bring to a party. Strawberries cost $1.60 per pound and raspberries cost $1.75 per pound. If she only has $10 to spend on berries, which inequality represents the situation where she buys x pounds of strawberries and y pounds of raspberries?
    1) $1.60x + 1.75y \leq 10$ 3) $1.75x + 1.60y \leq 10$
    2) $1.60x + 1.75y \geq 10$ 4) $1.75x + 1.60y \geq 10$

3   Peter has $100 to spend on drinks for his party. Bottles of lemonade cost $2 each, and juice boxes cost $0.50 each. If x is the number of bottles of lemonade and y is the number of juice boxes, which inequality models this situation?
    1) $0.50x + 2y \leq 100$ 3) $2x + 0.50y \leq 100$
    2) $0.50x + 2y \geq 100$ 4) $2x + 0.50y \geq 100$

4   David has two jobs. He earns $8 per hour babysitting his neighbor's children and he earns $11 per hour working at the coffee shop. Write an inequality to represent the number of hours, x, babysitting and the number of hours, y, working at the coffee shop that David will need to work to earn a minimum of $200. David worked 15 hours at the coffee shop. Use the inequality to find the number of full hours he must babysit to reach his goal of $200.

5   A school plans to have a fundraiser before basketball games selling shirts with their school logo. The school contacted two companies to find out how much it would cost to have the shirts made. Company A charges a $50 set-up fee and $5 per shirt. Company B charges a $25 set-up fee and $6 per shirt. Write an equation for Company A that could be used to determine the total cost, A, when x shirts are ordered. Write a second equation for Company B that could be used to determine the total cost, B, when x shirts are ordered. Determine algebraically and state the minimum number of shirts that must be ordered for it to be cheaper to use Company A.

6   The senior class at Hills High School is purchasing sports drinks and bottled water to sell at the school field day. At the local discount store, a case of sports drinks costs $15.79, and a case of bottled water costs $5.69. The senior class has $125 to spend on the drinks. If x represents the number of cases of sports drinks and y represents the number of cases of bottled water purchased, write an inequality that models this situation. Nine cases of bottled water are purchased for this year's field day. Use your inequality to determine algebraically the maximum number of full cases of sports drinks that can be purchased. Explain your answer.

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Answer Section

1 ANS: 4   REF: fall0715ia
2 ANS: 1   REF: 061806ai
3 ANS: 3   REF: 062205ai
4 ANS:

$8x + 11y \geq 200$ $8x + 11(15) \geq 200$

$$8x + 165 \geq 200$$

$$8x \geq 35$$

$$x \geq 4.375$$

5 hours

REF: fall1309ai

5 ANS:

$A(x) = 5x + 50$ $5x + 50 < 6x + 25$ 26 shirts

$B(x) = 6x + 25$ $25 < x$

REF: 061933ai

6 ANS:

$15.79x + 5.69y \leq 125$ $15.79x + 5.69(9) \leq 125$ 4 cases can be bought. Buying 5 cases totals more than \$125.

$$15.79x \leq 73.79$$

$$x \leq 4.7$$

REF: 082333ai