No calculator

Multiple Choice

1. In order to bring his business to the next level, Christov wants to gain at least 2,000 followers on a popular social media platform. From his own personal account, he knows that each original post gains him approximately 3 new followers and every 5 reposts gains about 1. Which of the following inequalities represents the numbers of posts, P, and reposts, R, Christov needs to reach his goal of gaining at least 2,000 followers?

   A) $3P + 0.2R \geq 2{,}000$

   B) $3P + 5R \leq 2{,}000$

   C) $1P + 5R \geq 2{,}000$

   D) $0.2P + 5R \leq 2{,}000$

2. Joe is buying apples and persimmons at the grocery store. Each apple costs $0.99 and each persimmon costs $0.79. If joe has $10 which of the following inequalities describes x, the number of apples and y, the number of persimmons that he can buy?

   A) $0.79x + 0.99y \geq 10$

   B) $0.99x + 0.79y \geq 10$

   C) $0.79x + 0.99y \leq 10$

   D) $0.99x + 0.79y \leq 10$

3. A trivia contest asks both multiple choice and free response questions. Contestants receive 3 points for each correct multiple choice question and 5 points for each correct free response question, and they must score more than 60 points to advance to the next round. If Eva advanced to the next round of the contest, which of the following inequalities describes x, the number of multiple choice questions, and y, the number of free response questions, that she answered correctly?

    A) $3x + 5y > 60$

    B) $3x + 5y \geq 60$

    C) $3x + 5y < 60$

    D) $3x + 5y \leq 60$

4. Dante commutes to work 4 mornings a week. For his commute each morning, he walks for 10 minutes, waits and rides the bus fo x minutes, and waits and rides the train for y minutes. If Dante spends at least 3.5 <u>hours</u> on his morning commute each <u>week</u>, which of the following inequalities best describes Dante's weekly morning commute?

    A) $x + y + 10 \geq 3.5(60)$

    B) $x + y + 10 \geq 3.5(60)(4)$

    C) $4(x+y) + 10 \geq 3.5(60)$

    D) $4(x+y + 10) \geq 3.5(60)$

5. Vanessa has a $ 900 travel and lodging budget for her vacation. She found round-trip plane tickets for x dollars total, a hotel for y dollars per night, and free shuttle service between the airport and the hotel. If she plans to stay at the hotel for 5 nights, and she spends less than what she budgeted on travel and lodging, which of the following inequalities best describes the scenario?

    A) $x + 5y > 900$

    B) $5x + y > 900$

    C) $x + 5y < 900$

    D) $5x + y < 900$

Calculator OK

Multiple Choice

6. A memory chip is designed to hold a number of transistors and heat sinks. The transistors hold memory while the heat sinks cool the chip. There must be at least one heat sink for every 2000 transistors to prevent overheating. Also, each transistor has an area of $2.0 \times 10^{-10} mm^2$ (square millimeters), each heat sink has an area of $3.6 \times 10^{-6} mm^2$, and the total area of transistors and heat sinks must be at most $2mm^2$ What is the approximate maximum number of transistors that the chip can hold according to this design?

    A) 2.78×10^2

    B) 5.56×10^5

    C) 1.0×10^9

    D) 1.0×10^{10}

7. Some zoo monkeys are on a diet of fruit and nuts. Fruit has about 13.3 grams(g) of sugar per cup and 1.36g of protein per cup. Nuts have about 4.04g of sugar per cup and 15.56g of protein per cup. Each monkey must get between 70g and 90g of sugar per day and at least 85g of protein per day. Which of the following daily diets fits the monkeys' needs?

    A) 0 cups of fruit and 16 cups of nuts

    B) 4 cups of fruit and 8 cups of nuts

    C) 8 cups of fruit and 4 cups of nuts

    D) 16 cups of fruit and 0 cups of nuts

8. $70L + 60S < 5{,}600$

$0.02L + 0.01S \leq 2.5$

Members of the swim team want to wash their hair. Each short-haired member requires the same number of liters of water and soap, and each long-haired member requires the same number of liters of water and soap. The bathroom has less than 5,600 liters of water and at most 2.5 liters of shampoo. The system of inequalities shown above, where S represents the number of short-haired members and L the number of long-haired members, describes this situation. Does the bathroom have enough water and shampoo for 8 long-haired members and 7 short-haired members?

    A) The bathroom has enough water and shampoo.

    B) The bathroom has enough water but not enough shampoo.

    C) The bathroom has enough shampoo but not enough water.

    D) The bathroom has neither enough water nor enough shampoo.

9. $L + S \geq 12$

   $425L + 125 \geq 4{,}500$

   Matthew wants to sell laptops and smartphones. Each laptop is sold for the same amount of money, and each smartphone is sold for the same amount of money. He wants to sell at least 12 devices and earn at least \$ 4,500. The system of inequalities shown above, where L represents the number of laptops and S the number of smartphones, describes this situation. Does Matthew meet both of his goals by selling 9 laptops and 6 smartphones?

   A) Matthew meets both of his goals.

   B) Matthew sells the expected number of devices but doesn't earn the expected amount of money.

   C) Matthew earns the expected amount of money but doesn't sell the expected number of devices.

   D) Matthew doesn't meet either of his goals.

10. A tennis club is organizing group lessons. The club supplies each player with 40 new balls, which costs the club \$1 each ball. Each player pays \$300 for the lessons. The club must pay each instructor \$1,000 for conducting the lessons, and there must be at least 1 instructor for every 6 players. Which amount of players and instructors meets these requirements and still gives the club a net profit?

    A) 6 players and 2 instructors

    B) 10 players and 3 instructors

    C) 13 players and 2 instructors

    D) 16 players and 3 instructors