

Do #7 to 13

7. Body mass index (BMI) is a comparison of a person's body mass to his or her height. A high BMI can be an indicator of high body fat, which can lead to health problems. According to the American Heart Association, an adult is underweight if his or her BMI is less than 18.5, or overweight if it is greater than or equal to 25.0. Which of the following number lines could be used to model a healthy BMI range for an adult?



- A)
- B)
- C)
- D)

$\frac{2(4k+1)}{3} \geq \frac{k(6+5)-3}{2}$

8. Which of the following correctly describes the possible values of k in the inequality above?

A) $k \leq -1$
 B) $k \geq -1$
 C) $k \leq \frac{13}{17}$
 D) $k \geq \frac{13}{17}$

*switch the ineq. sign when \times or \div by a neg. #.

$$2(2(4k+1)) \geq 3(k(6+5)-3)$$

$$4(4k+1) \geq 3(11k-3)$$

$$16k+4 \geq 33k-9$$

$$\begin{array}{r} -16k+9 \\ -16k+9 \\ \hline 13 \geq 17k \\ \frac{13}{17} \geq k \end{array}$$

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Plot1 Plot2 Plot3

■ $\backslash Y_1 \equiv \left(\frac{2(4X+1)}{3} \right) \geq \left(\frac{X(6+5)-3}{2} \right)$ ■

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9. A math teacher decides to create several practice tests for her students before they take the SAT. She wants to make some non-calculator tests and some calculator tests so that her students will be able to practice both. She figures that each non-calculator test will take her 3 hours to create, and each calculator test will take 4 hours to create. If she is willing to devote at most 6 hours per week of her time for the next 5 weeks to create the practice tests, and she wants to provide at least 8 practice tests, which of the following systems of inequalities can help her determine how many of each type of test she can create?

- A) $n + c \geq 8$ ✓
 $3n + 4c \leq 6$
- B) $n + c \geq 8$ ✓**
 $3n + 4c \leq 30$
- C) $n + c \leq 8$
 $3n + 4c \geq 30$
- D) $n + c \geq 6$
 $3n + 4c \leq 8$

$\begin{cases} y > x \\ 3y \leq -4x + 6 \end{cases}$

$y \leq -\frac{4}{3}x + 2$

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10. A system of inequalities and the corresponding graph are shown above. Which part of the graph could represent all of the solutions to the system?

- A) A
- B) B
- C) C
- D) D**

11. A housing down payment is money that a prospective buyer provides up front when purchasing a home and is usually a percent of the purchase price of the home. A lender typically requires private mortgage insurance (PMI) when the buyer's down payment is less than 20% of the purchase price. To secure a mortgage, buyers also need to have additional cash on hand for closing costs and prepaid property tax. Suppose a buyer wants to purchase a \$375,000 house and must have \$7,200 on hand for closing costs and property tax. Which of the following inequalities represents the total funds (f) the buyer must have on hand to secure the mortgage without having to pay PMI?

- A) $f \leq 0.2(375,000) + 7,200$
 B) $f \geq 0.2(375,000) + 7,200$
 C) $f \leq 0.2(375,000 + 7,200)$
 D) $f \geq 0.2(375,000 + 7,200)$

$$f \geq 0.2(375000) + 7200$$

12. If $-\frac{5}{2} < -2m + 1 < -\frac{7}{5}$, what is the greatest possible integer value of the expression


$$10m - 5?$$

- A) 6
 B) 7
 C) 10
 D) 12

$$-5\left(-\frac{5}{2}\right) < -5(-2m+1) < -5\left(-\frac{7}{5}\right)$$

$$12.5 > 10m - 5 > 7$$

$$18,000 + x \leq 72,000$$

13.  The federal interstate weight limit for a particular four-axle transfer truck is 18,000 pounds per axle. The cab (front) of the truck weighs 11,000 pounds, and the trailer of the truck, when empty, weighs 7,000 pounds. The inequality above represents the legally permissible weight range for this truck when travelling on an interstate. What does the value 18,000 represent in the inequality?
- A) The weight of the truck when fully loaded
 - B) The weight of the truck when the trailer is empty
 - C) The maximum weight allowed per axle
 - D) The maximum weight of the cargo being transported