Linear Inequalities- Part 1

1. Solve the following compound inequality.

$$4x - 9 > -21 \text{ OR } -2x \leq -18$$

- **A.** $x \geq 9$
- **B.** $x < -3$ OR $x \geq 9$
- **C.** $-3 < x \leq 9$
- **D.** $x > -3$

2. Which of the following number lines shows the solution to the compound inequality given below?

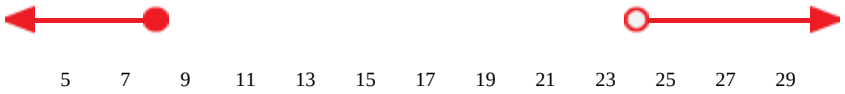
$$-26 \geq -4x + 6 > -90$$

- **A.**

- **B.**

- **C.**

- **D.**



3. An insurance company is considering implementing a plan based on mileage. The current plan, Plan A, charges a flat rate of $152.50 per month. Plan B charges a flat rate of $113.50 per month plus an additional $0.05 per mile driven the previous month. Using the inequality below, find the number of miles, x, where the cost of Plan B is less than the cost of Plan A.

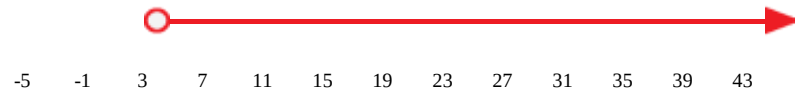
$$\$113.50 + \$0.05x < \$152.50$$

- **A.** The mileage must be greater than 1,560 miles.
- **B.** The mileage must be less than 780 miles.
- **C.** The mileage must be greater than 780 miles.
- **D.** The mileage must be less than 5,320 miles.

4. Marcus planted two trees in his backyard, an oak tree and a pecan tree. The height, in feet, of the oak tree after x years can be modeled by the expression $5x + 6$. The height, in feet, of the pecan tree after x years can be modeled by the expression $3x + 10$.

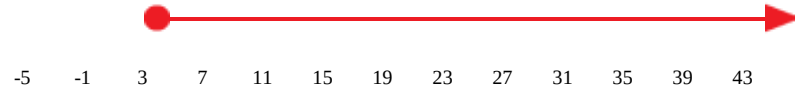
Which graph represents the time when the height of the oak tree is greater than or equal to the height of the pecan tree?

A.

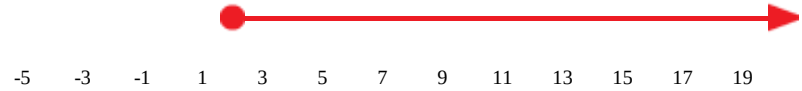


B.

C.



D.



5. Brandon writes math problems for a publishing company. This week he has already written 12 problems. There are 3 days left in the work week. He set a goal for himself to write at least 33 problems this week. If this situation is modeled by the inequality below, what is the average number of problems, *x*, he needs to write each of the remaining work days in order to reach his goal?

$$12 + 3x \geq 33$$

A. Brandon needs to write an average of at most 7 problems each of the remaining work days this week.

B. Brandon needs to write an average of at most 15 problems each of the remaining work days this week.

C. Brandon needs to write an average of at most 5 problems each of the remaining work days this week.

D. Brandon needs to write an average of at least 7 problems each of the remaining work days this week.

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6. Kevin is baking bread for a family function. The initial temperature of the oven is twice the room temperature. He knows that yeast, a key ingredient, thrives within the temperature range of 90° F to 95° F. So to facilitate yeast growth, Kevin decreases the temperature of the oven by 44° F.

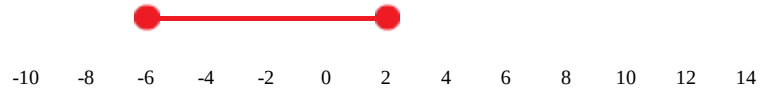
Write an inequality represents the given situation?

7. Which of the following number lines shows the solution to the compound inequality given below?

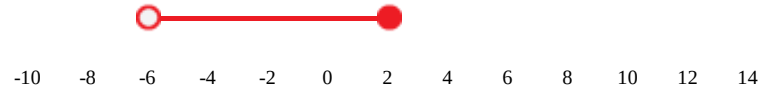
$$5x + 8 \geq -22 \quad \text{AND} \quad -2x - 1 > -5$$

A.

B.



C.



D.

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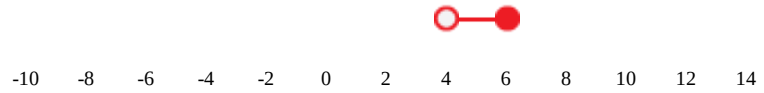
8. Which of the following number lines shows the solution to the compound inequality given below?

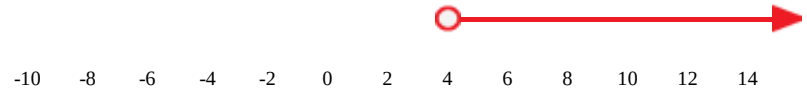
$$5x - 7 > 13 \quad \text{OR} \quad -3x \leq -18$$

A.

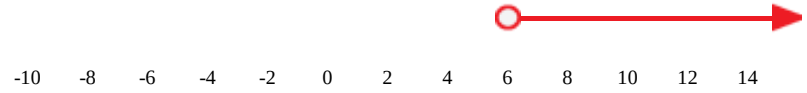
B.



C.



D.



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9. Amy is planning the seating arrangement for her wedding reception. Each round table can sit 12 guests. The head table can sit the bride and groom with the 6 wedding attendants. If Amy expects 186 to 306 guests to attend her wedding, including the attendants, what is the range for the number of round tables she will need for her reception?

- **A.** 21 to 31
- **B.** 15 to 25
- **C.** 16 to 26
- **D.** 20 to 23

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10. Isabella wants to create 21 ounces of new hand lotion, with a minimum 15% concentration of beeswax, from a mixture of two lotions. One lotion has a 21% concentration of beeswax, and the second lotion has a concentration of 5% beeswax. Based on the inequality below, how much of the 21% lotion, *x*, will she need?

$$0.21x + 0.05(21 - x) \geq 3.15$$

- **A.** Isabella will need at most 14 ounces of the 21% lotion to make 21 ounces of the new hand lotion with a minimum of 15% beeswax.
- **B.** Isabella will need at most 13.125 ounces of the 21% lotion to make 21 ounces of the new hand lotion with a minimum of 15% beeswax.
- **C.** Isabella will need at least 13.125 ounces of the 21% lotion to make 21 ounces of the new hand lotion with a minimum of 15% beeswax.
- **D.** Isabella will need at most 10.5 ounces of the 21% lotion to make 21 ounces of the new hand lotion with a minimum of 15% beeswax.

Answers

1. D
2. C
3. B
4. D
5. D
6. $67 < x < 69.5$
7. D
8. C
9. B
10. C