Inequalities Word Problems

Question 1 .

Roberta wants to create 28 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?

$$0.21x + 0.05(28 - x) \geq 4.2$$

- **A.** Roberta will need at least 17.5 ounces of the 21% lotion to make 28 ounces of the new hand lotion with a minimum of 15% beeswax.
- **B.** Roberta will need at most 17.5 ounces of the 21% lotion to make 28 ounces of the new hand lotion with a minimum of 15% beeswax.
- **C.** Roberta will need at most 14 ounces of the 21% lotion to make 28 ounces of the new hand lotion with a minimum of 15% beeswax.
- **D.** Roberta will need at most 18.67 ounces of the 21% lotion to make 28 ounces of the new hand lotion with a minimum of 15% beeswax.

Question 2 .

Eve knits scarves for her online store. This week she has already knitted 9 scarves. There are 2 days left in the work week. She set a goal for herself to knit at least 17 scarves and at the most 21 scarves this week. Eve wants to know how many scarves she should knit each day to meet her goal.

Which inequality represents the given situation?

- **A.** $17 \leq 2x - 9 \geq 21$
- **B.** $17 \leq 2x - 9 \leq 21$
- **C.** $17 \geq 2x + 9 \geq 21$
- **D.** $17 \leq 2x + 9 \leq 21$

Question 3 .

Ben's business averages $3,500 per month in internet sales plus another $200 per salesperson per month. Based on the inequality below, how many salespeople, s, need to be working in order for Ben's business to generate at least $4,700 in monthly revenue?

$$\$3{,}500 + \$200s \geq \$4{,}700$$

- **A.** Ben needs at most 6 salespeople working.
- **B.** Ben needs at most 11 salespeople working.
- **C.** Ben needs at most 16 salespeople working.
- **D.** Ben needs at least 6 salespeople working.

Question 4 .

Priya makes bracelets for her online store. Her monthly business expenses are $470. She sells an average of 78 bracelets per month. Based on the inequality below, if she wants to profit at least $700, how much should she charge, b, per bracelet?

$$78b - \$470 \geq \$700$$

- **A.** Priya needs to charge at most $12 per bracelet.
- **B.** Priya needs to charge at least $15 per bracelet.
- **C.** Priya needs to charge at most $22 per bracelet.
- **D.** Priya needs to charge at most $15 per bracelet.

Question 5 .

An insurance company is considering implementing a plan based on mileage. The current plan, Plan A, charges a flat rate of $193.20 per month. Plan B charges a flat rate of $132.00 per month plus an additional $0.06 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.

$$\$132.00 + \$0.06x < \$193.20$$

- **A.** The mileage must be less than 5,420 miles.
- **B.** The mileage must be less than 1,020 miles.
- **C.** The mileage must be greater than 2,040 miles.
- **D.** The mileage must be greater than 1,020 miles.

Question 6 .

Shelly is going shopping at the mall to buy 3 pairs of shoes. She has a coupon for $2 off per pair of shoes after buying the first pair at full price. Shelly is willing to spend $80 to $122 not including tax. If the shoes she purchases are all the same price, what is the least and most amount she can spend per pair?

- **A.** $25 and $39
- **B.** $27 and $41
- **C.** $29 and $43
- **D.** $28 and $42

Question 7 .

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 27 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?

$$12 + 3x \geq 27$$

- **A.** Brandon needs to write an average of at most 5 problems each of the remaining work days this week.
- **B.** Brandon needs to write an average of at least 5 problems each of the remaining work days this week.
- **C.** Brandon needs to write an average of at most 13 problems each of the remaining work days this week.
- **D.** Brandon needs to write an average of at most 3 problems each of the remaining work days this week.

Question 8 .

Amy is planning the seating arrangement for her wedding reception. Each round table can sit 8 guests. The head table can sit the bride and groom with the 6 wedding attendants. If Amy expects 150 to 206 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.** 19 to 26
- **B.** 18 to 25
- **C.** 24 to 31
- **D.** 20 to 27

Question 9 .

The junior class has been selling roses as an ongoing fundraiser. Roses sell for $4.25 each and, to date, they have raised $2,002.43. They would like to raise a total of $2,869.43 by the end of the year. If this situation is modeled by the inequality below, how many more roses, *x*, do they need to sell to raise at least $2,869.43?

$$2{,}002.43 + \$4.25x \geq \$2{,}869.43$$

- **A.** The junior class would need to sell at least 204 roses.
- **B.** The junior class would need to sell at most 675 roses.
- **C.** The junior class would need to sell at most 204 roses.
- **D.** The junior class would need to sell at most 471 roses.

Question 10 .

The city of Cartesianville is sponsoring an event to collect food for those in need in their community. A local church has already donated 414 pounds of food. The event is expecting 193 attendees. Based on the inequality below, how many pounds of food, f, should each attendee donate in order to collect at least 993 pounds of food?

$$414 + 193f \geq 993$$

- **A.** Each attendee should donate at least 3 pounds of food.
- **B.** Each attendee should donate at most 3 pounds of food.
- **C.** Each attendee should donate at most 7 pounds of food.
- **D.** Each attendee should donate at most 6 pounds of food.

Question 11 .

Paul is selling his paintings at the town square. He has 35 paintings to sell in all and needs to sell at least 19 paintings in one day to recover his cost. He has already sold 3 paintings since the morning and has 5 more hours to sell his paintings. Paul wants to know about how many paintings he should sell per hour to recover his cost.

Which inequality represents the given situation?

- **A.** $19 \leq 5x - 3 \geq 35$
- **B.** $19 \leq 5x + 3 \leq 35$
- **C.** $19 \leq 5x + 3 \geq 35$
- **D.** $19 \leq 5x - 3 \leq 35$

Question 12 .

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.

Which inequality represents the given situation?

- **A.** $90 \leq 2x - 44 \leq 95$
- **B.** $90 \leq 2x + 44 \leq 95$
- **C.** $90 \geq 2x - 44 \leq 95$
- **D.** $90 \geq 2x + 44 \leq 95$

Question 13 .

Ethan wants to buy an action figure for $3 and several packs of trading cards for $6 each at a toy store. He can spend no more than $39 at the store today, but if he spends $15 or more he will receive a free poster.

Write and solve an inequality where x represents how many packs of cards Ethan can buy today to receive the free poster.

- A. $3 \leq x \leq 7$
- B. $2 \leq x \leq 6$
- C. $2 < x < 6$
- D. $3 < x < 7$

Question 14 .

Marie is saving money for home repairs. To date, she has saved $1,683. She needs at least $1,971 for the repairs. She plans to set aside $36 per week to add to her current savings. If this situation is modeled by the inequality below, how many more weeks, x, does she need to continue saving in order to have enough money for the repairs?

$$\$1{,}683 + \$36x \geq \$1{,}971$$

- A. Marie needs to continue saving for at most 102 more weeks.
- B. Marie needs to continue saving for at most 8 more weeks.
- C. Marie needs to continue saving for at least 8 more weeks.
- D. Marie needs to continue saving for at most 25 more weeks.

Question 15 .

The blues band, Jonny and the Silver Toads, charges $20 per ticket at their performances. Their next venue charges them $900 for use of the venue. Based on the inequality below, how many tickets, t, do they need to sell in order to make a profit of at least $1,500?

$$\$20t - \$900 \geq \$1{,}500$$

- A. The band needs to sell at least 120 tickets.
- B. The band needs to sell at most 96 tickets.
- C. The band needs to sell at most 103 tickets.
- D. The band needs to sell at most 120 tickets.

Answers

1. A
2. D
3. D
4. B
5. B
6. D
7. B
8. B
9. A
10. A
11. B
12. A
13. B
14. C
15. A