

Symbolize & Solve Inequalities

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1. Tina pet sits to earn extra money. She charges a flat service fee of \$20, plus \$20 per day. If one of her customers spent less than \$100, which of the following inequalities could be used to solve for x , the number of days the customer paid for pet sitting?

- A. $\$20x + \$20 < \$100$
- B. $\$20x < \100
- C. $\$20x - \$20 < \$100$
- D. $\$20x < \120

2. Ralphie's dad has a nutritionist who instructed him to consume less than 2,064 calories per day. He has already eaten 1,559 calories today and wants to eat some fruit bars that are 54 calories each. Which of the following inequalities could be used to solve for x , the number of fruit bars Ralphie's dad can eat without going over his calorie allotment?

- A. $54x + 1,559 < 2,064$
- B. $54x < 2,064$
- C. $54x - 1,559 < 2,064$
- D. $54x < 1,559$

3. Lisa has to spend less than \$200.00 on new clothes for spring. She has already spent \$125.40 and wants to buy some shirts that are each \$20.28. Which of the following inequalities could be used to solve for x , the number of shirts Lisa can buy with the money she has left?

- A. $\$20.28x < \200.00
- B. $\$20.28x - \$125.40 < \$200.00$
- C. $\$20.28x + \$125.40 < \$200.00$
- D. $\$20.28x < \125.40

4. To date, this year, Company XYZ has sold 525 units. They sell units at an average rate of 15 per week. The company wants to sell more than 750 units this year. Which of the following inequalities could be used to solve for x , the number of weeks necessary to reach the company's year-end goal?

- A. $15x > 1,275$
- B. $15x + 525 > 750$
- C. $15x - 525 > 750$
- D. $15x > 750$

5. Chris types at an average speed of 35 words per minute. He has already typed 1,250 words of his final paper. The paper has to be more than 3,000 words. Which of the following inequalities could be used to solve for x , the number of minutes it will take Chris to type his paper?

- A. $35x - 1,250 > 3,000$
- B. $35x + 1,250 > 3,000$
- C. $35x > 4,250$
- D. $35x > 3,000$

6. Jeannette is participating in a hot dog eating contest. She has already eaten 18 hot dogs but needs to eat more than 35 hot dogs to win. Jeannette is eating 3.2 hot dogs per minute. Which of the following inequalities could be used to solve for x , the number of minutes Jeannette needs to eat hot dogs to win the contest?

- A. $3.2x > 35$
- B. $3.2x > 18$
- C. $3.2x - 18 > 35$
- D. $3.2x + 18 > 35$

7. Becky is collecting money for a fundraiser. She wants to collect more than \$1,710.00 and has already raised \$253.00. Becky averages \$23.00 from each person who donates to the fundraiser. Which of the following inequalities could be used to solve for x , the number of additional people Becky needs to collect from to meet her fundraising goal?

- A. $\$23.00x + \$253.00 > \$1,710.00$
- B. $\$23.00x - \$253.00 > \$1,710.00$
- C. $\$23.00x > \$1,710.00$
- D. $\$23.00x > \253.00

8. Amy has to write a paper for school that has more than 3,130 words. She has already written 1,065 words and writes at a rate of 295 words per day. Which of the following inequalities could be used to solve for x , the number of days it will take Amy to finish her paper?

- A. $295x - 1,065 > 3,130$
- B. $295x > 1,065$
- C. $295x > 3,130$
- D. $295x + 1,065 > 3,130$

9. Tammy must run more than 64 miles total to reach her fitness goals. She has already run 32 miles and runs 4 miles per day. Which of the following inequalities could be used to solve for x , the number of days Tammy needs to run to reach her fitness goals?

- A. $4x > 64$
- B. $4x + 32 > 64$
- C. $4x - 32 > 64$
- D. $4x > 32$

10. Karla's doctor recommended her daily caffeine intake stay under 400 milligrams. Today, Karla has already had 320 milligrams of caffeine. Her favorite soda contains 40 milligrams. Which of the following inequalities could be used to solve for x , the number of sodas Karla can still have today?

- A. $40x < 720$
- B. $40x < 400$
- C. $40x - 320 < 400$
- D. $40x + 320 < 400$

11. When shopping for a baby doll for her daughter, Ms. Martin found that the price of five baby dolls was less than \$110. Which of the following inequalities represents this information?

- A. $5 \times b < \$110$
- B. $5 + b \leq \$110$
- C. $5 + b < \$110$
- D. $5 \times b \leq \$110$

12. Steven has 70 baseball cards. Steven and Lucas have more than 83 baseball cards together. Which of the following inequalities represents the number of baseball cards the two boys have?

- A. $b > 70 + 83$
- B. $70 + b > 83$
- C. $70 + b < 83$
- D. $70 - b > 83$

13. Amy and Ebony are shopping. Amy has \$81. Together, Amy and Ebony have less than \$163. Which inequality below shows the amount of money the two girls have?

- A. $\$81 + x > \163
 - B. $\$81 + x < \163
 - C. $x - \$81 < \163
 - D. $\$163 + x < \81
-

14. Colby must spend less than 250 minutes playing video games in one day. He plays different games for 25 minutes each, and Colby has already played 100 minutes today.

$$25x + 100 < 250$$

How many more games can Colby play today?

- A. $x < 100$
 - B. $x < 150$
 - C. $x < 6$
 - D. $x < 25$
-

15. Blaire needs more than 660 total points on assignments in her math class to pass. She only has 220 points and needs to do some extra credit assignments that are worth 55 points each.

$$55x + 220 > 660$$

How many extra credit assignments does Blaire need to complete in order to pass?

- A. $x > 55$
 - B. $x > 220$
 - C. $x > 8$
 - D. $x > 440$
-

16. A moderately active 40-pound dog needs an average of 1,218 calories per day. Taryn's dog participated in a dog race this morning, so it will need more than the average calories. Taryn's dog has already eaten 609 calories, and she feeds her dog 203 calories per meal.

$$203x + 609 > 1,218$$

How many more meals does Taryn need to feed her dog today?

- A. $x > 203$
 - B. $x > 3$
 - C. $x > 609$
 - D. $x > 4$
-

17. Efrain must spend less than \$95 on his phone bill this month. He pays a monthly fee of \$19, plus an additional \$4 for each long-distance call.

$$4x + 19 < 95$$

How many long-distance calls can Efrain make this month?

- A. $x < 19$
 - B. $x < 57$
 - C. $x < 76$
 - D. $x < 4$
-

18. Fran is limited to watching television less than 12.8 hours per week. She has already watched 4.8 hours, and each show is 0.8 of an hour long.

$$0.8x + 4.8 < 12.8$$

How many more shows can Fran watch this week?

- A. $x < 4.8$
- B. $x < 10$
- C. $x < 8$
- D. $x < 0.8$

19. Brittany gets 5 points in her book club for every book she reads, and she already has 25 points. She needs more than 95 points to receive the grand prize.

$$5x + 25 > 95$$

How many more books does Brittany need to read to receive the grand prize?

- A. $x > 25$
- B. $x > 5$
- C. $x > 70$
- D. $x > 14$

20. Gina is having a party and wants to spend less than \$580. She has already spent \$400. The only item left on her list is pizzas, which cost \$15 each. How many pizzas, x , can she purchase and stay under her budget?

- A. $x < 27$
- B. $x < 39$
- C. $x < 165$
- D. $x < 12$

21. Deena works at a customer service call center. She fields an average of 6 calls per hour. Employees are encouraged to field more than 240 calls per week. Deena has already fielded 96 calls this week. How many more hours, x , does Deena need to work this week to reach the weekly goal of fielded calls?

- A. $x > 3$
- B. $x > 16$
- C. $x > 30$
- D. $x > 24$

22. Sarah's youth group is selling candy bars for a fundraiser. The candy bars cost \$1.50 each. To date, they have raised \$900. Their goal is to raise more than \$2,400. How many more candy bars, x , do they need to sell to reach their goal?




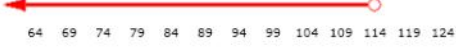
- A. $x > 1,000$
- B. $x > 1,800$
- C. $x > 2,800$
- D. $x > 1,500$

23. A cat adoption facility takes in an average of 6 cats per day. The facility has to keep their cat occupancy below 300. Currently, the facility has 258 cats. If none of their cats get adopted, how many more days, x , can the facility continue to take in cats?



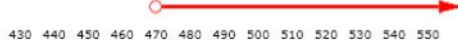

- A. $x < 5$
- B. $x < 7$

- C. $x < 42$
- D. $x < 3$

24. Margaret is planning a wedding reception. She wants to spend less than her budget of \$4,826, and Margaret has already spent \$2,226. The meal price per guest is \$25. How many guests, x , can Margaret invite to the reception and stay under budget?




- A. 
- B. 
- C. 
- D. 

25. Carlene is selling T-shirts for a fundraiser. The T-shirts cost \$20 each. To date, she has raised \$700. Her goal is to raise more than \$10,300. How many more T-shirts, x , does Carlene need to sell to reach her goal?





- A. 
- B. 
- C. 
- D. 

26. A baseball team has a goal of hitting more than 60 home runs this season. They average 5 home runs each game and have already hit 25 home runs so far. How many more games, x , will it take the baseball team to reach its home run hitting goal if they continue to average 5 home runs per game?





- A. 

- B. 
- C. 
- D. 

27. Ronny is selling coffee mugs for \$3.50. So far, he has earned \$301.00. Ronny needs to earn more than \$413.00 in order to meet his sales goal. How many more coffee mugs, x , does Ronny need to sell in order to reach his sales goal?





- A. 
- B. 
- C. 
- D. 

28. A dance club gets an average of 25 customers per hour. The club has to keep their occupancy below 400 at any time during the day. Currently, the club has 175 customers. If none of the customers leave, how many more hours, x , can the club continue to accept new customers?





- A. 
- B. 
- C. 
- D. 

5 6 7 8 9 10 11 12 13 14 15 16 17

29. Philip is having a party and wants to spend less than \$488. He has already spent \$400. The only item left on his list is sodas, which cost \$8 per case. How many cases of soda, x , can Philip purchase and stay under his budget?

- A. 
- B. 
- C. 
- D. 

30. Juanita works at a telemarketing company. She makes an average of 10 sales calls per hour. Employees are encouraged to make more than 400 calls per week. Juanita has already made 120 calls this week. How many more hours, x , does Juanita need to work this week to reach the weekly goal of sales calls?

- A. 
- B. 
- C. 
- D. 

Answers

1. A
2. A
3. C
4. B

- 5. B
- 6. D
- 7. A
- 8. D
- 9. B
- 10. D
- 11. A
- 12. B
- 13. B
- 14. C
- 15. C
- 16. B
- 17. A
- 18. B
- 19. D
- 20. D
- 21. D
- 22. A
- 23. B
- 24. A
- 25. B
- 26. A
- 27. C
- 28. A
- 29. B
- 30. A

Explanations

1. The situation can be modeled by a linear inequality of the form $px + q < r$, where p is the rate Tina charges per day, q is the flat service fee, and r is the amount the customer pays.

$$20x + 20 < 100$$

2. The situation can be modeled by a linear inequality of the form $px + q < r$, where p is the number of calories per fruit bar, q is the number of calories Ralphie's dad has already consumed, and r is the total number of calories he is allowed per day.

$$54x + 1,559 < 2,064$$

3. The situation can be modeled by a linear inequality of the form $px + q < r$, where p is the cost per shirt, q is the amount Lisa has already spent, and r is the total amount of money available for Lisa to spend.

$$20.28x + 125.40 < 200.00$$

4. The situation can be modeled by a linear inequality of the form $px + q > r$, where p is the rate at which the company sells units, q is the number of units already sold this year, and r is the number of units the company wants to sell.

$$15x + 525 > 750$$

5. The situation can be modeled by a linear inequality of the form $px + q > r$, where p is the average speed Chris types, q is the number of words he has already typed, and r is the number of words required for the paper.

$$35x + 1,250 > 3,000$$

6. The situation can be modeled by a linear inequality of the form $px + q > r$, where p is the number of hot dogs Jeannette eats per minute, q is the number of hot dogs Jeannette has already eaten, and r is the total number of hot dogs she needs to eat to win.

$$3.2x + 18 > 35$$

7. The situation can be modeled by a linear inequality of the form $px + q > r$, where p is the average amount each person donates, q is the amount Becky has already raised, and r is the amount of money Becky wants to raise total.

$$\text{\$}23.00x + \text{\$}253.00 > \text{\$}1,710.00$$

8. The situation can be modeled by a linear inequality of the form $px + q > r$, where p is the number of words Amy writes per day, q is the number of words Amy has already written, and r is the total number of words in the paper.

$$295x + 1,065 > 3,130$$

9. The situation can be modeled by a linear inequality of the form $px + q > r$, where p is the number of miles Tammy runs per day, q is the number of miles Tammy has already run, and r is the total number of miles she needs to run more than.

$$4x + 32 > 64$$

10. The situation can be modeled by a linear inequality of the form $px + q < r$, where p is the number of milligrams of caffeine per soda, q is the amount of caffeine Karla has already had today, and r is her recommended amount of caffeine.

$$40x + 320 < 400$$

11. Let b be the price of the baby doll. Rewrite the situation using b for the baby doll.

The price of five baby dolls was less than \$110.

The price of 5 b was less than \$110.

Next, put " x " between five and b and substitute "<" for "less than."

$$5 \times b < \text{\$}110$$

12. Let b be the number of baseball cards that Lucas has. Rewrite the situation using 70 for Steven and b for Lucas.

Steven and Lucas have more than 83 baseball cards together.

70 and b have more than 83 baseball cards together

Next, substitute "+" for "and" and ">" for "more than."

$$70 + b > 83$$

13. Let x represent the amount of money that Ebony has. Rewrite the situation using \$81 for Amy and x for Ebony.

Amy and Ebony have less than \$163.

\$81 and x have less than \$163.

Next, substitute "+" for "and" and "<" for "less than."

$$\mathbf{\$81 + x < \$163}$$

14. In the given inequality, x represents the number of games Colby can play. Use opposite operations to isolate x .

$$\begin{aligned} 25x + 100 &< 250 \\ 25x + 100 - 100 &< 250 - 100 \\ 25x &< 150 \\ 25x \div 25 &< 150 \div 25 \\ x &< 6 \end{aligned}$$

Therefore, the solution set for how many more games Colby can play today is $x < 6$.

15. In the given inequality, x represents the number of extra credit assignments Blaire needs to complete. Use opposite operations to isolate x .

$$\begin{aligned} 55x + 220 &> 660 \\ 55x + 220 - 220 &> 660 - 220 \\ 55x &> 440 \\ 55x \div 55 &> 440 \div 55 \\ x &> 8 \end{aligned}$$

Therefore, the solution set for how many extra credit assignments Blaire needs to complete is $x > 8$.

16. In the given inequality, x represents the number of meals Taryn needs to feed her dog. Use opposite operations to isolate x .

$$\begin{aligned} 203x + 609 &> 1,218 \\ 203x + 609 - 609 &> 1,218 - 609 \\ 203x &> 609 \\ 203x \div 203 &> 609 \div 203 \\ x &> 3 \end{aligned}$$

Therefore, the solution set for how many meals Taryn needs to feed her dog is $x > 3$.

17. In the given inequality, x represents the number of long-distance calls Efrain can make. Use opposite operations to isolate x .

$$\begin{aligned} 4x + 19 &< 95 \\ 4x + 19 - 19 &< 95 - 19 \\ 4x &< 76 \\ 4x \div 4 &< 76 \div 4 \\ x &< 19 \end{aligned}$$

Therefore, the solution set for how many long-distance calls Efrain can make this month is $x < 19$.

18. In the given inequality, x represents the number of shows Fran can watch. Use opposite operations to isolate x .

$$\begin{aligned} 0.8x + 4.8 &< 12.8 \\ 0.8x + 4.8 - 4.8 &< 12.8 - 4.8 \\ 0.8x &< 8 \\ 0.8x \div 0.8 &< 8 \div 0.8 \\ x &< 10 \end{aligned}$$

Therefore, the solution set for how many more shows Fran can watch is $x < 10$.

19. In the given inequality, x represents the number of books Brittany needs to read. Use opposite operations to isolate x .

$$\begin{aligned} 5x + 25 &> 95 \\ 5x + 25 - 25 &> 95 - 25 \\ 5x &> 70 \\ 5x \div 5 &> 70 \div 5 \\ x &> 14 \end{aligned}$$

Therefore, the solution set for how many books Brittany needs to read is $x > 14$.

20. The situation can be modeled by a linear inequality of the form $px + q < r$, where p is the cost per pizza, q is the amount of money already spent, and r is the party budget.

Set up an inequality and solve.

$$\begin{aligned} px + q &< r \\ \$15x + \$400 &< \$580 \\ \$15x &< \$580 - \$400 \\ \$15x &< \$180 \\ \mathbf{x} &< \mathbf{12} \end{aligned}$$

21. The situation can be modeled by a linear inequality of the form $px + q > r$, where p is the number of fielded calls per hour, q is the number of calls Deena has already fielded this week, and r is the goal number of fielded calls.

Set up an inequality and solve.

$$\begin{aligned} px + q &> r \\ 6x + 96 &> 240 \\ 6x &> 240 - 96 \\ 6x &> 144 \\ \mathbf{x} &> \mathbf{24} \end{aligned}$$

22. The situation can be modeled by a linear inequality of the form $px + q > r$, where p is the cost per candy bar, q is the amount of money already raised, and r is their fund raising goal.

Set up an inequality and solve.

$$\begin{aligned}
 px + q &> r \\
 \$1.50x + \$900 &> \$2,400 \\
 \$1.50x &> \$2,400 - \$900 \\
 \$1.50x &> \$1,500 \\
 \mathbf{x} &> \mathbf{1,000}
 \end{aligned}$$

23. The situation can be modeled by a linear inequality of the form $px + q < r$, where p is the average number of cats taken in per day, q is the number of cats already at the facility, and r is the occupancy limit.

Set up an inequality and solve.

$$\begin{aligned}
 px + q &< r \\
 6x + 258 &< 300 \\
 6x &< 300 - 258 \\
 6x &< 42 \\
 \mathbf{x} &< \mathbf{7}
 \end{aligned}$$

24. The situation can be modeled by a linear inequality of the form $px + q < r$, where p is the cost per guest, q is the amount of money already spent, and r is the budget.

Set up an inequality and solve.

$$\begin{aligned}
 px + q &< r \\
 \$25x + \$2,226 &< \$4,826 \\
 \$25x &< \$4,826 - \$2,226 \\
 \$25x &< \$2,600 \\
 \mathbf{x} &< \mathbf{104}
 \end{aligned}$$

Therefore, Margaret can invite less than 104 guests and stay under her budget, as shown on the number line below.



25. The situation can be modeled by a linear inequality of the form $px + q > r$, where p is the cost per T-shirt, q is the amount of money already raised, and r is Carlene's fundraising goal.

Set up an inequality and solve.

$$\begin{aligned}
 px + q &> r \\
 \$20x + \$700 &> \$10,300 \\
 \$20x &> \$10,300 - \$700 \\
 \$20x &> \$9,600 \\
 \mathbf{x} &> \mathbf{480}
 \end{aligned}$$

Therefore, Carlene needs to sell more than 480 T-shirts to meet her goal, as shown on the number line below.



26. The situation can be modeled by a linear inequality of the form $px + q > r$, where p is the number of home runs per game, q is the number of home runs the team has already hit, and r is the goal number of home runs.

Set up an inequality and solve.

$$\begin{aligned} px + q &> r \\ 5x + 25 &> 60 \\ 5x &> 60 - 25 \\ 5x &> 35 \\ x &> 7 \end{aligned}$$

Therefore, it will take more than 7 games for the team to reach its home run hitting goal, as shown on the number line below.



27. The situation can be modeled by a linear inequality of the form $px + q > r$, where p is the cost per coffee mug, q is the amount of money already earned, and r is his sales goal.

Set up an inequality and solve.

$$\begin{aligned} px + q &> r \\ \$3.50x + \$301.00 &> \$413.00 \\ \$3.50x &> \$413.00 - \$301.00 \\ \$3.50x &> \$112.00 \\ x &> 32 \end{aligned}$$

Therefore, Ronny needs to sell more than 32 coffee mugs to reach his sales goal, as shown on the number line below.



28. The situation can be modeled by a linear inequality of the form $px + q < r$, where p is the average number of customers per hour, q is the number of customers already at the club, and r is the occupancy limit.

Set up an inequality and solve.

$$\begin{aligned} px + q &< r \\ 25x + 175 &< 400 \\ 25x &< 400 - 175 \\ 25x &< 225 \\ x &< 9 \end{aligned}$$

Therefore, the club can continue to accept new customers for less than 9 hours, as shown on the number line below.



29. The situation can be modeled by a linear inequality of the form $px + q < r$, where p is the cost per case of soda, q is the amount of money already spent, and r is the party budget.

Set up an inequality and solve.

$$\begin{aligned} px + q &< r \\ \$8x + \$400 &< \$488 \\ \$8x &< \$488 - \$400 \\ \$8x &< \$88 \\ x &< 11 \end{aligned}$$

Therefore, Philip can purchase less than 11 cases of soda and stay under his budget, as shown on the number line below.



30. The situation can be modeled by a linear inequality of the form $px + q > r$, where p is the number of sales calls per hour, q is the number of calls Juanita has already made this week, and r is the goal number of sales calls.

Set up an inequality and solve.

$$\begin{aligned} px + q &> r \\ 10x + 120 &> 400 \\ 10x &> 400 - 120 \\ 10x &> 280 \\ x &> 28 \end{aligned}$$

Therefore, Juanita needs to work more than 28 hours to reach the weekly goal of sales calls, as shown on the number line below.

