

Inequality Word Problems

Problems with inequalities follow the same algebraic rules as those with equalities. When multiplying or dividing by a **negative** value, remember to “FLIP” the direction of the inequality symbol as you complete the operation on both sides.

Examples: The following examples are inequalities that follow the rules of algebra. Below are examples of problems of SHSAT level algebraic inequalities.

Problem #1: An inequality is $2(x) - 8 < 11$. Solve for x .

Solution: Use the same inverse operation rules as with an equation.

$2x - 8 < 11$	<u>Algebra Step</u>
$2(x) < 19$	Add 8 to both sides
$x < 9.5$	Divide by 2

Answer : The solution set is $x < 9.5$

Problem #2: On Saturday, Maya read at least 5 fewer than 3 times as many pages in her book as she did on Friday. On Saturday she read 58 pages. How many pages did Maya read on Friday?

Solution:

$$\begin{aligned}
 (\text{Saturday}) &\geq 3(\text{Friday}) - 5 \\
 58 &= 3(F) - 5 \\
 63 &= 3(F) \\
 21 &= F
 \end{aligned}$$

ANSWER: On Friday, Maya had read 21 pages or less.

Problem #3: A taxi driver charges a flat fee of \$2.00 for the first $\frac{1}{5}$ mile and plus \$0.75 per additional $\frac{1}{5}$ mile. The tip is included in the mileage rate. Sven has only \$35.00 to pay for a taxi ride. How many miles at most can Sven ride in the taxi?

Solution:

$$2 + \$0.75(5m - 1) \leq \$35.00$$

$$2 + 3.75m - 0.75 \leq \$35.00$$

$$1.25 + \$3.75m \leq \$35.00$$

$$\$3.75m \leq \$33.75$$

Answer : The solution set is $m \leq 9$. Sven can go up to 9 miles in the taxi.

SHSAT Lesson #12 Classwork: Inequality Word Problems

<p>1. Which value is a solution to the inequality</p> $3x + 9 \geq 21?$	<p>A. 5 B. 3 C. 0 D. - 2 E. - 3</p>			
<p>2. All three statements are true for "a" and "b"</p> <table border="1"> <tbody> <tr> <td>$\frac{a}{b} < \frac{b}{a}$</td> <td>$a^2 = 2a$</td> <td>$ab = 18$</td> </tr> </tbody> </table> <p>what is the value of b ?</p>	$\frac{a}{b} < \frac{b}{a}$	$a^2 = 2a$	$ab = 18$	<p>A. 2 B. 3 C. 6 D. 9 E. 18</p>
$\frac{a}{b} < \frac{b}{a}$	$a^2 = 2a$	$ab = 18$		
<p>3. Aaron found a solution to a problem. Which value is part of the solution set for the inequality $x < 35$?</p>	<p>A. 36 B. 60 C. 35 D. 29 E. 101</p>			
<p>4. If $(2x + 1) < 9$, then for all possible values of x that make this inequality true,</p>	<p>A. $x < 8$ B. $x > 8$ C. $x > 4$ D. $x < 4$ E. $x > \frac{1}{4}$</p>			
<p>5. If $(3x + 1) < 7$, then for all possible values of x, what values make this inequality true ?</p>	<p>A. $x < 8$ B. $x > 6$ C. $x > 4$ D. $x < 6$ E. $x < \frac{8}{3}$</p>			
<p>6. Which of the following is equivalent to the inequality $12 < x + 4$?</p>	<p>A. $x < 8$ B. $x > 8$ C. $x > - 8$ D. $x > 16$ E. $x < 16$</p>			

SHSAT Lesson #12: Classwork (EASY LEVEL)

<p>7. Sammy earns \$20 per day plus \$6 for every sale he makes. On Friday, he wants to earn at least \$50. Which describes the number of sales he needs to make to reach his goal?</p>	<p>A. At least 5 sales B. At most 5 sales C. At least 6 sales D. At most 6 sales E. No more than 8 sales</p>
<p>8. Line ABCD has <i>Point A</i> = - 5, <i>Point B</i> = - 2, and also <i>Point C</i> = 1 and <i>Point D</i> = 6. How much longer is BD than AC ? (Draw it!)</p>	<p>A. 0 B. 1 C. 2 D. 3 E. 4</p>
<p>9. If x is greater than $\frac{1}{2}$ but less than 1, which of the following has the largest value ?</p>	<p>A. $3x + 1$ B. x^2 C. $\frac{1}{x}$ D. $1 - x$ E. x^3</p>
<p>10. What integer(s) satisfies the following equations $x^2 \geq 0$ and $x \leq 0$?</p>	<p>A. 1 B. 0 C. No solutions D. Any negative integer E. Cannot be determined</p>
<p>11. Sarvananda saved $\frac{3}{5}$ of the money he earned doing yard work. He saved \$120 in all. How much money did he earn doing yard work ?</p>	<p>A. \$150 B. \$200 C. \$225 D. \$300 E. \$450</p>
<p>12. The cafeteria has 4 cases of tuna and 9 single cans of tuna. In all, there are 65 cans of tuna. How many cans of tuna are in each case ?</p>	<p>A. 12 B. 13 C. 14 D. 16 E. 18</p>

SHSAT Lesson #12: Classwork (MID LEVEL)

<p>13. A soccer team is selling key chains to raise money for the team. They ordered 100 keychains that cost \$0.25 each. There is a flat shipping rate of \$8. The team sells the keychains for \$2 each. What is the fewest number of keychains that the team needs to sell to make a profit?</p>	<p>A. 13 B. 14 C. 15 D. 16 E. 17</p>
<p>14. Peyson filled a 10 gallon jug by using a smaller container. She needed to fill the container at most 18 times. Which could NOT be the measure of the size of the container? (more than one answer could be correct)</p>	<p>A. 1 gallon B. 2 gallons C. Half Gallon D. Three fourths Gallon E. Three fifths Gallon</p>
<p>15. Maria collected 50 cans for a homeless food pantry. Eah can is worth \$0.05 but her goal is to collect at least \$50 for the charity. Which inequality represents this situation ?</p>	<p>A. $500 + 5c \geq 5,000$ B. $50(0.5) + 5c \geq 5,000$ C. $50(0.05) + (0.05)c \geq 50$ D. $(0.05)c + 50 \geq 5,000$ E. $500 + (0.05)c \geq 5,000$</p>
<p>16. Phillippe has at most \$50 to spend while shopping. He wants to buy some books that cost \$4 each and a DVD that cost \$17.</p> <p>What is the greatest number of books he can buy?</p>	<p>A. 12 books B. 11 books C. 9 books D. 8 books E. 5 books 3</p>
<p>17. If $x = 3$ and $y = 5$, what is the value of $x^y - y^x$?</p>	<p>A. 0 B. 36 C. 50 D. 96 E. 118</p>
<p>18. Sharona's age is at most 3 more than twice Kayla's age. If Sharona is 35 years old, which inequality best represents the situation, where "a" represents Kayla's age?</p>	<p>A. $2a + 3 < 35$ B. $2a + 3 \leq 35$ C. $2a + 3 < 35$ D. $2a + 3 > 35$ E. $2a + 3 \geq 35$</p>

SHSAT Lesson #12: Classwork (CHALLENGE LEVEL)

<p>19. A furniture company makes chairs and benches with modular wood cubes. A bench is made of 3 green and 1 red cube. A chair is made of 1 green and 2 red cubes. If the company has 12 green and 8 red cubes, what is the maximum profit it can make, based on the given profit model below ?</p> <p>A sale of a chair is a profit of \$12, a bench is a profit of \$16.</p>	<p>A. \$ 64 B. \$ 72 C. \$ 68 D. \$ 52 E. \$ 48</p>
<p>20. Sergei trains circus bears to perform under the big top. The ringmaster tells Sergei he will pay him \$350 per 15 minute show with the trained bears. How many performances, minimum, must Sergei & the Bears work per week for 8 weeks in order to earn over \$10,000 dollars. (Subtract \$500 per week food for fish. Bears eat a lot of fish.)</p>	<p>A. 65 shows B. 55 shows C. 40 shows D. 37 shows E. 29 shows</p>
<p>21. The total value of some coins is \$1.20. The coins contain nickels, dimes, and quarters only (<i>at least one of each kind</i>). What is the fewest number of coins possible?</p>	<p>A. 5 B. 6 C. 7 D. 8 E. 9</p>
<p>22. Caitlin has \$80 and earns \$7.25 an hour babysitting. To take a creative writing course during the summer, she needs to have at least \$250. How many hours, minimum, must she babysit to cover the cost of the writing course?</p>	<p>A. 20 hours B. 21 hours C. 22 hours D. 24 hours E. 28 hours</p>
<p>23. The length of a rectangle is equal to 4 inches more than twice the width. Three times the length plus two times the width is equal to 28 inches. What is the area of the rectangle ?</p>	<p>A. 8 square inches B. 16 square inches C. 20 square inches D. 24 square inches E. 28 square inches</p>
<p>24. Ashleigh put 26 coins in a piggy bank with a total value of \$2.13. She took out 3 quarters, 9 dimes, and 6 pennies. Which coins are still in her piggy bank ?</p>	<p>A. 2d, 4n, 2p B. 1q, 7p C. 1q, 1d, 4n, 2p D. 6n, 2p E. 2q, 2d, 2n, 2 p</p>

SHSAT Lesson #12: Classwork: Grid In Questions (ALL LEVELS)

<p>25. (Easy Level)</p> <p>What is $(30a + 8 + 7b - 45)$, when $a = -1$ and $b = 2$?</p>	Grid In
<p>26. (Easy Level)</p> <p>Which value balances $5(x - 14) = 3(4x)$?</p>	Grid In
<p>27. (Mid Level)</p> <p>What is an integer solution set to the double inequality $-13 < 4x - 5 < 11$?</p>	Grid In
<p>28. (Mid Level)</p> <p>Three consecutive integers sum to 363. What is the largest number?</p>	Grid In
<p>29. (Challenge Level)</p> <p>Laura and Charles are collecting toys for Toys for Tots. Charles collected 170 toys in 3 days. Laura collected 95 toys in 5 days, At this rate, how many toys can they collect together in 30 days?</p>	Grid In
<p>30. (Challenge Level)</p> <p>What is the value of the expression when $x = 3/2$? (Express answer as a reduced fraction a/b form)</p> $x - \frac{x^2 - 2}{2x}?$	Grid In

SHSAT Lesson #12 Homework: Inequality Word Problems

<p>1. If $(6 + 4x) > 7$, then which value of x makes this inequality true ?</p>	<p>A. $x = -15$ B. $x = -10$ C. $x = -3$ D. $x = 0$ E. $x = 1$</p>			
<p>2. Which numerical value of x that satisfies the inequality $3x + 5 > 21$?</p>	<p>A. 1 B. 2 C. 3 D. 4 E. 6</p>			
<p>3. What integer satisfies the following equations $2x^2 \leq 0$ and $-5x \leq 0$?</p>	<p>A. 1 B. 0 C. -1 D. Any negative integer E. Cannot be determined from the information given</p>			
<p>4. The following three statements are true:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td style="text-align: center;">$\frac{a}{b} < \frac{b}{a}$</td> <td style="text-align: center;">$a^2 = 4a$</td> <td style="text-align: center;">$ab = 22$</td> </tr> </tbody> </table> <p>what is the value of b ?</p>	$\frac{a}{b} < \frac{b}{a}$	$a^2 = 4a$	$ab = 22$	<p>A. 2.5 B. 3.5 C. 4.5 D. 5.5 E. 6.5</p>
$\frac{a}{b} < \frac{b}{a}$	$a^2 = 4a$	$ab = 22$		
<p>5. If gumballs cost \$0.29 each then what is the most number of gumballs that can be purchased with \$5.00 ?</p>	<p>A. 20 B. 18 C. 17 D. 16 E. 14</p>			
<p>6. If $30 < (2n) < 120$, and n is a positive integer, what is the largest possible value for n ?</p>	<p>A. 239 B. 180 C. 116 D. 60 E. 59</p>			

SHSAT Lesson #12: Homework (EASY LEVEL)

<p>7. If x is greater than $\frac{4}{5}$ but less than 1, which of the following has the largest value?</p>	<p>A. $3x + 1$ B. x^2 C. $\frac{1}{x}$ D. $1 - x$ E. x^3</p>
<p>8. Let n be a number from the set:</p> $\{-4, -3, -2, -1, 0, 1, 2, 3\}$ <p>What is the range of values of n^2?</p>	<p>A. $-9 \leq n^2 \leq 16$ B. $9 \leq n^2 \leq 16$ C. $3 \leq n^2 \leq 4$ D. $0 \leq n^2 \leq 2$ E. $0 \leq n^2 \leq 16$</p>
<p>9. Let $P = \frac{18}{25}$, $Q = \frac{5}{7}$, and $R = \frac{3}{4}$. Then</p>	<p>A. $P < Q < R$ B. $P < R < Q$ C. $Q < P < R$ D. $Q < R < P$ E. $R < P < Q$</p>
<p>10. If $\frac{7}{50} < \frac{1}{x} < \frac{8}{51}$ where x is an integer, then $x =$</p>	<p>A. 8 B. 7 C. 6 D. 5 E. 4</p>
<p>11. Kyoko made 60 ounces of cranberry sauce. What is the maximum number of servings she can make if each person eats between 4-6 ounces?</p>	<p>A. 10 B. 12 C. 13 D. 14 E. 15</p>
<p>12. Richard saved $\frac{1}{5}$ of the money each he earned delivering magazines. He saved \$250 in all after 5 weeks of work. What is the least number of weeks he must continue to save from work, from this moment in time, to buy a new computer that costs \$600?</p>	<p>A. 7 weeks B. 9 weeks C. 11 weeks D. 14 weeks E. 16 weeks</p>

SHSAT Lesson #12: Homework (MID LEVEL)

<p>13. You have 5 large boxes that can each hold 8 soccer balls, and 15 small boxes that can each hold 5 of the same soccer balls. If you have 99 soccer balls, what is the greatest number of boxes you can completely fill?</p>	<p>A. 13 B. 14 C. 15 D. 16 E. 18</p>
<p>14. Team Banana Bread had a better soccer season with 15 losses, 6 wins and 5 draws with ten games remaining.</p> <p>If a win = 3 points, a draw = 1 point, and a loss = 0 points, what is the least number of wins must they have in their remaining ten games to have at least 45 points for the season ? (assume they earn no more draws.)</p>	<p>A. 4 B. 5 C. 6 D. 8 E. 10</p>
<p>15. If $a^2b > 216$ and $a = -6$, what is the least integer value for b?</p>	<p>A. 13 B. 14 C. 5 D. 6 E. 7</p>
<p>16. If $(a + 2)(b + 2)c > ab + 25$ and $a = 3$ and $b = 5$, what is the least value for c that makes this inequality true?</p>	<p>A. 5 B. 4 C. 3 D. 2 E. 1</p>
<p>17. The cafeteria uses many cases of tuna that each have 24 cans. Each week, they take at least 12 of the cans and feed the cats in the alley behind the zoo. How much does it cost, minimum, to feed the cats for another year (52 weeks) if 1 can costs \$0.60 ?</p>	<p>A. \$360.00 B. \$374.40 C. \$420.00 D. \$450.00 E. \$895.00</p>
<p>18. Let m, n and p represent real numbers with $m > 0$ and $n > p$. Which statement is NOT true ?</p>	<p>A. $m + n > m + p$ B. $\frac{n}{m} > \frac{p}{m}$ C. $m - n > m - p$ D. $n - m > p - m$ E. $nm > pm$</p>

SHSAT Lesson #12: Homework (CHALLENGE LEVEL)

<p>19. The total value of some coins is \$1.05. The coins contain nickels, dimes, and quarters only (<i>at least one of each kind</i>). What is the fewest number of coins possible?</p>	<p>A. 5 B. 6 C. 7 D. 8 E. 9</p>
<p>20. Look at this sequence: {J14, L11, N8, P5...} What term should come next ?</p>	<p>A. Q2 B. Q3 C. R2 D. S2 E. S3</p>
<p>21. A photograph is 5 inches wide and 8 inches in length. It is enlarged so that its new length is 20 inches.</p> <p>Which proportion can be used to find how many inches the width of the enlarged photograph is ?</p>	<p>A. $\frac{x}{5} = \frac{8}{20}$ B. $\frac{5}{20} = \frac{8}{x}$ C. $\frac{5}{x} = \frac{20}{x}$ D. $\frac{x}{5} = \frac{20}{8}$ E. $\frac{5}{8} = \frac{x}{20}$</p>
<p>22. After three days, some hikers discover that they have used $\frac{2}{5}$ of their supplies. At this rate, how many more days can they go forward before they have to turn around ?</p>	<p>A. 0.75 days B. 1.5 days C. 3.75 days D. 4.5 days E. 6 days</p>
<p>23. If x is positive and $x^2 = 63$, between which two numbers does x lie ?</p>	<p>A. 4 and 5 B. 5 and 6 C. 6 and 7 D. 7 and 8 E. 8 and 9</p>
<p>24. If $r > 0$ and $s < 0$, which expression must be positive ?</p>	<p>A. $r - s^2$ B. $s + r^2$ C. $s^2 - r$ D. $r^2 * s$ E. $s^2 \div r$</p>

SHSAT Lesson #12: Homework: Grid In Questions (ALL LEVELS)

<p>25. (Easy Level)</p> $-6\frac{3}{4} \div 2\frac{5}{8}$ <p>(Use “keep-change-flip”)</p>	Grid In
<p>26. (Easy Level)</p> <p>Harry has at most \$200 to spend while shopping. He wants to buy some Power Chargers that cost \$7 each and a used Video Game System that cost \$85. What is the greatest number of Power Chargers that he can buy?</p>	Grid In
<p>27. (Mid Level)</p> <p>Mr. Boonbear has \$800 and earns \$1.25 an hour babysitting. To take a creative writing course during the summer, he needs to have at least \$900. How many hours must he babysit to cover the cost of the writing course ?</p>	Grid In
<p>28. (Mid Level)</p> <p>Eight pounds of sunflower seeds, which cost \$2 dollars per pound, are mixed with 4 pounds of dried fruit, which costs \$5 per pound. What is the cost per one pound of the TOTAL mixture ?</p>	Grid In
<p>29. (Challenge Level)</p> <p>A bicyclist passes a farmhouse at 3:14 pm. At 3:56 pm the bicyclist passes a second farmhouse. If the bicyclist is traveling at a uniform rate of 12 mph, how far apart are the farmhouses ?</p>	Grid In
<p>30. (Challenge Level)</p> <p>What is the value of the expression when $x = 7/4$? (Express answer as a reduced fraction a/b form)</p> $x - \frac{x^2 - 3}{2x}$	Grid In

JW2542 for Chang Learning 2023 (Set F)