**Lesson 2.4: Creating and Solving Inequalities**

***Inequalities:*** is a statement that compares two expressions that are not strictly equal by using one of the following signs.

|  |  |
| --- | --- |
| Symbol | Meaning |
|  | Is less than |
|  | Is less than or equal to |
|  | Is greater than |
|  | Is greater than or equal to |
|  | Is not equal to |

***Examples:***

1). Nora is planning a birthday party for her little sister, Colleen. Nora’s budget will allow her to spend no more than $50 for party supplies. Eight children, including Colleen, will attend the party, and Nora wants to determine how much she could spend on party favors for each child. She will also purchase a cake for $10. Write an inequality that represents the situation, and find possible solutions.

Suppose Nora finds party favors that cost $4 each. Use the value of 4 for x and check to see if this inequality is true.

Suppose Nora finds party favors that cost $6 each. Use the value of 6 for x and check to see if this inequality is true.

***Creating and solving inequalities involving the distributive property***

2). Trina is buying 12 shirts for the drama club. She will choose a style for the blank shirts and then pay an additional charge of $2.75 for each shirt to have the club logo. If Trina cannot spend more than $99, how much can she spend on each blank shirt? Write and solve an inequality to find the possible cost of each blank shirt.

3). Sergio needs to buy gifts for 8 friends. He wants to give the same gift to all his friends and he plans to have the gifts wrapped for an additional charge of $1.50 each. If Sergio spends at least $70, he will receive free shipping on his order. Write and solve an inequality to determine how much Sergio needs to spend on each gift in order to receive free shipping.

4). Zachary is planning to send a video game to each of his two brothers. If he buys the same game for both brothers and pays $4.75 to ship each game, how much can he spend on each game without spending more than $100? Write and solve an inequality for this situation.

5). 6).

***Creating and Solving Inequalities with variables on both sides***

7). The Daily Info charges a fee of $650 plus $80 per week to run and ad. The People’s Paper charges $145 per week. For how many weeks must an ad run for the total cost at the Daily Info to be less expensive than the cost at the people’s paper? Let *x* be the number of weeks the d runs in the paper.

8). The home cleaning company charges $312 to power-wash the siding of a house plus $12 for each window. Power Clean charges $36 per window, and the price includes power-washing the siding. How many windows must a house have to make the total cost from the Home Cleaning Company less expensive than Power Clean? Let *w* be the number of windows.