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| Math 7 Unit 4 - Inequalities  Performance Task 2 |
| ***Standard(s) Addressed:***  **7.EE.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.  b. Solve word problems leading to inequalities of the form *px + q >; r* or *px + q < r*, where *p, q,* and *r* are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.* |
| ***Task:***  Real-World Inequalities   1. Kate wants to have her house painted. She wants to spend *no more than* $1,300. She has gotten estimates from multiple companies to compare prices. All companies charge a flat fee of $250 for the use of their equipment and then a varying hourly rate for the painting.   All of the companies estimated that it would require about 35 hours to complete the  work at Kate’s house.   |  |  | | --- | --- | | Company | Hourly Rate | | A+ Painting | $42 | | Ace Painting | $39 | | Cover it! | $30 | | Paint Plus | $27 | | Mark’s Painting | $24 |  1. Which companies can Kate use and stick to her budget? Show your work and explain. Put an X next to the companies that she can use!  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  | |  |  | | --- | --- | | X | Company | |  | A+ Painting | |  | Ace Painting | |  | Cover it! | |  | Paint Plus | |  | Mark’s Painting | |  1. For the companies that Kate CAN’T use (the companies without an “X” next to it in the chart above) for 35 hours and stay under her budget of $1,300, how many full hours could she use them for and still stay under $1,300? Set up and solve an inequality to determine your answers. Be sure to label each set of work with the appropriate company. 2. Since 35 hours of work was an estimate, for some companies she would have money left over after being charged for 35 hours. Which companies would allow her extra time if necessary? How many additional full hours (beyond the estimate!) could she use with those companies? Be sure to write an inequality to prove your answers! 3. Mark wants to join a golf club. The table below shoes the cost to join and golf at the club.   Initial Fee: $5000  Per Game Fee: $45   1. Write an expression for his total cost if he plays *g* games. 2. Mark checked his savings account to see how many games he could afford to play if he wants to have at least $6,250 left in his savings at the end of the year. Write an inequality and solve.   SAVINGS BANK  Total Savings: $13, 410 |
| ***Solution and Rubric:***  Real-World Inequalities   1. Kate wants to have her house painted. She wants to spend *no more than* $1,300. She has gotten estimates from multiple companies to compare prices. All companies charge a flat fee of $250 for the use of their equipment and then a varying hourly rate for the painting.   All of the companies estimated that it would require about 35 hours to complete the  work at Kate’s house.   |  |  | | --- | --- | | Company | Hourly Rate | | A+ Painting | $42 | | Ace Painting | $39 | | Cover it! | $30 | | Paint Plus | $27 | | Mark’s Painting | $24 |  1. Which companies can Kate use and stick to her budget? Show your work and explain. Put an X next to the companies that she can use!  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 1,300 – 250 = $1,050  She has $1,050 to spend on the hourly rate.  A+ : 1,050/42 = 25 hours 🡪 not enough hours  Ace: : 1,050/39 = 26.9 hours 🡪 not enough hours  Cover it!: 1,050/30 = 35 hours 🡪 Exact amount!  Paint Plus: 1,050/27 = 38.8 hours 🡪 More than enough! | |  |  | | --- | --- | | X | Company | |  | A+ Painting | |  | Ace Painting | | X | Cover it! | | X | Paint Plus | | X | Mark’s Painting | |   Mark’s Painting: 1,050/24 = 43.75 hours 🡪 More than enough!  The companies that Kate can pick are Cover it!, Paint Plus, Mark’s Painting.   1. For the companies that Kate CAN’T use (the companies without an “X” next to it in the chart above) for 35 hours and stay under her budget of $1,300, how many full hours could she use them for and still stay under $1,300? *Set up and solve an inequality* to determine your answers. Be sure to label each set of work with the appropriate company.   A+:  Kate can use A+ for 25 hours before going over budget.    Ace: : Kate can use Ace for 26 full hours before going over budge.   1. Since 35 hours of work was an estimate, for some companies she would have money left over after being charged for 35 hours. Which companies would allow her extra time if necessary? How many additional full hours (beyond the estimate!) could she use with those companies? Be sure to write an inequality to prove your answers!   Paint Plus:  **Kate can use Paint Plus for 38 full hours before going over budget. She would have 3 hours of extra time beyond the estimate if she needs it.**  Mark’s Painting:  **Kate can use Mark’s Painting for 43 full hours before going over budget. She would have 8 hours of extra time beyond the estimate if she needs it.**   1. Mark wants to join a golf club. The table below shoes the cost to join and golf at the club.   Initial Fee: $5000  Per Game Fee: $45   1. Write an expression for his total cost if he plays *g* games.   5000 + 45*g*   1. Mark checked his savings account to see how many games he could afford to play if he wants to have at least $6,250 left in his savings at the end of the year. Write an inequality and solve. Possible Solution Process     SAVINGS BANK  Total Savings: $13, 410  Mark can play 48 games or fewer.   |  |  |  |  | | --- | --- | --- | --- | | 4 | 3 | 2 | 1 | | •Student demonstrates complete understanding of the mathematical concepts.  •The solutions completely address all mathematical concepts presented in the task.  •Where required, there is a clear, proficient explanation of the solution. | •Student demonstrates nearly complete understanding of mathematical concepts.  •The solutions address almost all of the mathematical concepts presented in the task. Minor errors may exist.  •Where required, there is a clear, explanation of the solution. | •Student demonstrates a vague understanding of the mathematical concepts.  •The solutions address some, but not all the mathematical concepts presented in the task.  •Where required, explanations are incomplete or not clear. | •Student demonstrates limited or no understanding of the mathematical concepts.  •The solutions do not address any of the mathematical concepts in the task.  •There is no explanation of the solution. | |
| ***Source(s):***  Adapted from:  <http://tncore.org/sites/www/Uploads/MathTasks_9.13/7thGradeTaskArc.pdf> |