Sorting Scenarios Card Sort Set

1. The cost to download music from iTunes is $1.29 per song. The cost to download music from Amazon Prime is $0.89 but you must pay a membership fee of $10 per month. How many songs would you need to buy, in a month, to have each program cost the same?

2. Kevin is considering two lawn care services. Pro Landscaping charges $10 for travel to Kevin's house and $45 per hour for maintaining his lawn. Green Landscaping does not charge a travel fee, but their maintenance charge is $65 an hour. How many hours of mowing will make the cost the same at both companies?

3. The math club wants to buy new T-shirts, so they ask two local companies how much it will cost for them to get shirts printed. Company A charges $50 set up and then each shirt is $7. Company B will cost $10 per shirt but will give them a $3 discount for each shirt because they are from the local middle school. For how many shirts will the two companies charge the same price?

4. Julie takes a certain number and doubles it, then adds eight to the new value. Joe starts with the same number and adds four to it first. He then doubles that sum. What number did they start with?

5. There are two rectangles with different dimensions but the same area. One rectangle has a width of 2 inches and an unknown length, x. The other rectangle has a width of 4 inches and a length of (x-8) inches. For what value of x will the following two rectangles have the same area?

6. Jose jogs home from school at a rate of 5 miles per hour. Jeff lives twice as far from school as Jose and rides his bike home at a rate of 10 miles per hour. If they both take the same amount of time to get home each day, how far from school do they each live?

7. Aidan has a jar full of nickels and three one-dollar bills. Alex has the same number of nickels as Aidan; however, he only has two one-dollar bills in addition to the coins. How many nickels must the boys have for them to have the same amount of money?

8. Jackson shovels his neighborhood driveways for 3 dollars an hour plus a 10 dollar one time rate. Pete shovels his neighborhood driveways for 3 dollars an hour plus a 12 dollar one time rate. How many hours would Jackson and Pete need to shovel for in order to earn the same?

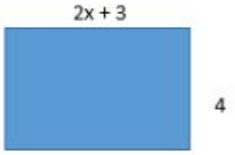
9. On Saturday, you and your friends went to Lang's Bowlarama. The price was $2 per game with an $18 shoe rental fee. On Sunday, you and your friends went to Mac's Bowlaway. The price was $4 per game with a $12 shoe rental fee. If you spent the same amount both days, how many games were played each day?

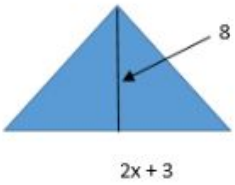
10. The science club wants to buy new T-shirts, so they ask two local companies how much it will cost for them to get shirts printed. Company A charges $40 set up and then each shirt is $7. Company B will cost $10 per shirt but will give them a $3 discount for each shirt because they are from the local middle school; their set up fee is $50 with a $10 discount for being from a local school. For how many shirts will the two companies charge the same price?

11. A pass to play in the pick-up basketball league at the recreation department is $30. If you have the pass it is $2 to play a game. If you don't have the pass it is $8 per game. How many games could you play so that the cost is the same for both situations?

12. Jane and Molly are saving to buy tickets for the Taylor Swift concert. Jane is depositing $12 every week, starting today. Molly is saving $10 per week starting today; however, she has $8 in her account already. When will the girls have the same amount of money in their accounts?

13. What value of x would give these two polygons the same area?





Names: _____ Date: _____

Sorting Scenarios Classification Sheet

With a partner, classify each of the following scenarios as having One Solution, No Solution, or All Real Numbers. Place an **X** in the appropriate column.

One Solution	No Solution	All Real Numbers	
			1. The cost to download music from iTunes is $1.29 per song. The cost to download music from Amazon Prime is $0.89 but you must pay a membership fee of $10 per month. How many songs would you need to buy, in a month, to have each program cost the same?
			2. Kevin is considering two lawn care services. Pro Landscaping charges $10 for travel to Kevin's house and $45 per hour for maintaining his lawn. Green Landscaping does not charge a travel fee, but their maintenance charge is $65 an hour. How many hours of mowing will make the cost the same at both companies?
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			4. Julie takes a certain number and doubles it, then adds eight to the new value. Joe starts with the same number and adds four to it first. He then doubles that sum. What number did they start with?
			5. There are two rectangles with different dimensions but the same area. One rectangle has a width of 2 inches and an unknown length, x. The other rectangle has a width of 4 inches and a length of (x-8) inches. For what value of x will the following two rectangles have the same area?
			6. Jose jogs home from school at a rate of 5 miles per hour. Jeff lives twice as far from school as Jose and rides his bike home at a rate of 10 miles per hour. If they both take the same amount of time to get home each day, how far from school do they each live?

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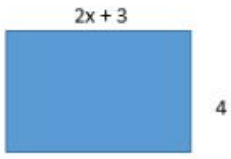
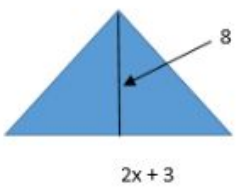
			13. What value of x would give these two polygons the same area?  

Sorting Scenarios Work Space

1. The cost to download music from iTunes is $1.29 per song. The cost to download music from Amazon Prime is $0.89 but you must pay a membership fee of $10 per month. How many songs would you need to buy, in a month, to have each program cost the same?

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13. What value of x would give these two polygons the same area?

Name: _____ Date: _____ Class: _____

Original Sorting Scenarios Student Recording Sheet

Reflection on Group Sorting Activity:

1. What strategies did you use? How well did the strategies you used work? What adjustments did you have to make in your strategies?

2. What role did you play in your group?

3. What challenges did you encounter as an individual and/or a group? How did you overcome or work on those challenges?

Name: _____ Date: _____ Class: _____

Sorting Scenarios:

On your own, choose one scenario from **each** of the three solution types. Explain how you know why each one belongs where you decided it goes. Each of your explanations must include setting up and solving an equation.

One Solution Scenario # _____	No Solutions Scenario # _____	All Real Numbers Scenario # _____
Equation with solution/explanation:	Equation with solution/explanation:	Equation with solution/explanation:

Create a Scenario:

On your own, create your own scenario for **one** solution type:

1. What is the situation/scenario? It must be different than the ones presented in the card sort.

2. Create and solve the equation that represents the scenario.

3. Identify the solution type for the equation/scenario you created and explain how you know.

Reflection on Individual Work

Reflect on the work you did as an individual.

1. How did the work you completed with your group help you in creating and solving a scenario?

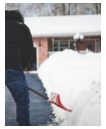
2. What challenges did you encounter? How did you overcome or work on those challenges?

Extension

Read the following scenario. Decide what type of solution set it has. Why? What makes this scenario unique from the others?

For what value of x will the following two rectangles have the same area? The first rectangle has a length of x inches and a width of 2 inches. The other rectangle has a width of 5 inches and a length of (x+3) inches.

Name: _____ Date: _____ Class: _____

 On Saturday, you and your friends went to Lang's Bowlarama. The price was $2 per game with an $18 shoe rental fee. On Sunday, you and your friends went to Mac's Bowlaway. The price was $4 per game with a $12 shoe rental fee. If you spent the same amount both days, how many games were played each day?	 Julie takes a certain number and doubles it, then adds eight to the new value. Joe starts with the same number and adds four to it first. He then doubles that sum. What number did they start with?	 Jackson shovels his neighborhood driveways for 3 dollars an hour plus a 10 dollar one time rate. Pete shovels his neighborhood driveways for 3 dollars an hour plus a 12 dollar one time rate. How many hours would Jackson and Pete need to shovel for in order to earn the same?
Equation with solution:	Equation with solution:	Equation with solution:
Solution type:	Solution type:	Solution type:
Explain what your solution means in terms of the situation.	Explain what your solution means in terms of the situation.	Explain what your solution means in terms of the situation.

Name: _____ Date: _____ Class: _____

Sorting Scenarios Student Recording/Reflection Sheet

1. What challenges did you encounter as an individual and/or a group? How did you overcome or work on those challenges?

2. How did **you** contribute to helping your group to understand and complete the task?

3. What strategies did you use? How well did the strategies you used work? What adjustments did you have to make in your strategies? (You can use a particular problem you worked on to illustrate this.)

Name _____KEY_____ Date _____

On your own, choose one scenario from each classification. Explain how you know the type of solution. Your explanations must include setting up and solving an equation.

Sorting Scenarios Answer Key

One Solution Scenario # _____	No Solutions Scenario # _____	All Real Numbers Scenario # _____
Equation with solution/explanation: **(1) The** cost to download music from iTunes is $1.29 per song. The cost to download music from Amazon Prime is $0.89 but you must pay a membership fee of $10 per month. How many songs would you need to buy to have each program cost the same? Let x = # of songs 1.29x = 0.89x + 10 .4x = 10 x =25 **(9) On** Saturday, you and your friends went to Lang's Bowlarama. The price was $2 per game with an $18 shoe rental fee. On Sunday, you and your friends went to Mac's Bowlaway. The price was $4 per game with a $12 shoe rental fee. If you spent the same amount both days, how many games were played each day? Let x = # of games 2x + 18 = 4x +12 6 = 2x 3 = x	Equation with solution/explanation: **(3) The** math club wants to buy new T-shirts, so they ask two local companies how much it will cost for them to get shirts printed. Company A charges $50 set up and then each shirt is $7. Company B will cost $10 per shirt but will give them a $3 discount for each shirt because they are from the local middle school. For how many shirts will the two companies charge the same price? Take out ten shirts. Let x = # of shirts ordered 7x + 50 = 7x + 10 50 ≠ 10 **(7) Aidan** has a jar full of nickels and three one-dollar bills. Alex has the same number of nickels as Aidan; however, he only has two one-dollar bills in addition to the coins. How many nickels must the boys have for them to have the same amount of money? Let x = # of nickels 0.05x + 3 = 0.05x + 2 3 ≠ 2	Equation with solution/explanation: **(4) Julie** takes a certain number and doubles it, then adds eight to the new value. Joe starts with the same number and adds four to it first. He then doubles that sum. What number did they start with? Let x = Julie's starting number 2x + 8 = 2(x+4) 2x+8 = 2x+8 0=0 **(6) Jose** jogs home from school at a rate of 5 miles per hour. Jeff lives twice as far from school as Jose and rides his bike home at a rate of 10 miles per hour. If they both take the same amount of time to get home each day, how far from school do they each live? Let d = distance in miles d/5 = 2d/10 d/5 = d/5 d=d **(10) The** science club wants to buy new T-shirts, so they ask two local companies how much it will cost for them to get shirts printed. Company A charges $40 set up and then each shirt is $7. Company B will cost $10 per shirt but will give them a $3 discount for

(11) A pass to play in the pick-up basketball league at the recreation department is $30. If you have the pass it is $2 to play a game. If you don't have the pass it is $8 per game. How many games could you play so that the cost is the same for both situations?

Let x = # of games

30 + 2x = 8x
30 = 6x
5=x

(2) Kevin is considering two lawn care services. Pro Landscaping charges $10 for travel to Kevin's house and $45 per hour for maintaining his lawn. Green Landscaping does not charge a travel fee, but their maintenance charge is $65 an hour. How many hours of mowing will make the cost the same at both companies?

Let x = # of hours mowing

10 + 45x = 65x
10 = 20x
0.5=x

(5) There are two rectangles with different dimensions but the same area. One rectangle has a width of 2 inches and an unknown length, x. The other rectangle has a width of 4 inches and a length of (x-8) inches. For what value of x will the following two rectangles have the same area?

Let x = unknown length

2x = 4(x-8)

(8) Jackson shovels his neighborhood driveways for 3 dollars an hour plus a 10 dollar one time rate. Pete shovels his neighborhood driveways for 3 dollars an hour plus a 12 dollar one time rate. How many hours would Jackson and Pete need to shovel for in order to earn the same?

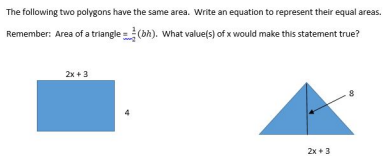
Let x = # of hours shoveled

3x + 10 = 3x + 12
10 ≠ 12

each shirt because they are from the local middle school; their set up fee is $50 with a $10 discount for being from a local school. For how many shirts will the two companies charge the same price? Take out ten shirts

Let x = # of shirts
7x + 40 = (10-3)x + 50-10
7x + 40 = 7x + 40
0=0

(13) What value of *x* would give these two polygons the same area?



(2x + 3)4 = (2x + 3)8/2
8x +12 = 8x + 12
0=0

2x = 4x -32 -2x = -32 x = 16 **(12) Jane** and Molly are saving to buy tickets for the Taylor Swift concert. Jane is depositing $12 every week, starting today. Molly is saving $10 per week starting today; however, she has $8 in her account already. When will the girls have the same amount of money in their accounts? Let *x* = the number of weeks 12x = 10x + 8 2x = 8 X = 4		