CSM Day 1

Your Name________________________________

Partner’s Name________________________________

- You will study students’ solutions to algebra equations. You should:
  1. Describe each student’s solution to your partner and finish labeling their steps.
  2. Talk about the answers to the questions and then write your final answers.
  3. Sometimes you will solve a problem using one of the student’s ways
- Sometimes, you will solve some problems on your own.
These two students solved the same problem in two different ways.

**Sammy’s Solution:**

\[
2(x - 3) = 8 \\
2x - 6 = 8 \\
2x = 14 \\
x = 7
\]

Distribute 2

*Add _________ on Both

Divide _________ on Both

**James’ Solution:**

\[
2(x - 3) = 8 \\
x - 3 = 4 \\
x = 7
\]

Divide 2 on Both

*Add _________ on Both

Complete the step labels for each solution in the blank spaces provided above.

1. How do you know if both ways to solve the problem are correct?

2. Sammy and James divided both sides by 2, but in different steps. Why is the divide step OK to do in either step?
These two students solved the same problem in two different ways.

**Jessica’s Solution:**

3\((t - 1) + 3(t - 1) = 30 \\
3t - 3 + 3t - 3 = 30 \\
6t - 6 = 30 \\
6t = 36 \\
t = 6

**Mary’s Solution:**

3\((t - 1) + 3(t - 1) = 30 \\
6(t - 1) = 30 \\
t - 1 = 5 \\
t = 6

Complete the step labels for each solution in the blank spaces provided above.

3. Describe 2 ways that these students’ solution steps are similar.

   (1)  

   (2)  

4. To solve 4\((y + 5) + 6(y + 4) + 5(y + 2) = 42, whose first step would work? Circle one: Jessica Mary

Explain your reasoning:

GP1: Working with your partner, solve the following equation using Mary’s way.

\[ 6(x + 4) + 5(x + 4) = 22 \]
SOLVE THESE PROBLEMS BY YOURSELF. You will solve each problem in **two ways**. Be sure to show your work. Next, check your answers with your partner. Last, raise your hand so a teacher can check your work.

\[ 4(x - 1) = 24 \]

**Way 1**

\[ 4(x - 1) = 24 \]

**Way 2**

\[ 4(x - 1) = 24 \]

\[ 9 = 3(x - 4) + 6(x - 4) \]

**Way 1**

\[ 9 = 3(x - 4) + 6(x - 4) \]

**Way 2**

\[ 9 = 3(x - 4) + 6(x - 4) \]
These two students solved the same problem in two different ways.

**Alexander’s Solution:**

\[
8 = 2(n - 6) \\
8 = 2n - 12 \\
20 = 2n \\
10 = n
\]

**Alicia’s Solution:**

\[
8 = 2(n - 6) \\
4 = n - 6 \\
10 = n
\]

Complete the step labels for each solution in the blank spaces provided above.

5. Describe 2 ways these students' solution steps are similar:

   (1)

   (2)

6. Alicia’s way is easier than Alexander’s way when:
These two students solved the **same problem in two different ways**.

<table>
<thead>
<tr>
<th>Angela’s Solution:</th>
<th>Jonathan’s Solution:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(9 = 5(m + 2) + 4(m + 2))</td>
<td>(9 = 5(m + 2) + 4(m + 2))</td>
</tr>
<tr>
<td>(9 = 5m + 10 + 4m + 8)</td>
<td>(9 = 9(m + 2))</td>
</tr>
<tr>
<td>(9 = 9m + 18)</td>
<td>Combine ______________\</td>
</tr>
<tr>
<td>-9 = 9m</td>
<td>Combine ______________\</td>
</tr>
<tr>
<td>-1 = m</td>
<td>Subtract ______________\ on Both</td>
</tr>
<tr>
<td></td>
<td>Subtract ______________\ on Both</td>
</tr>
<tr>
<td></td>
<td>Divide ______________\ on Both</td>
</tr>
<tr>
<td></td>
<td>Divide ______________\ on Both</td>
</tr>
</tbody>
</table>

Complete the step labels for each solution in the blank spaces provided above.

7. ________________’s way is better on this problem because:

8. If the problem were \(8 = 3(j + 6) + 4(j + 2)\), whose first step would work? **Circle One:** Angela Jonathan

Explain your reasoning:
PLEASE STOP HERE AND WAIT UNTIL WEDNESDAY: DAY 2

Do you have the same partner as yesterday? Please circle one. **YES or NO.**

If not, please write your partner’s name here: ________________________________
These two students solved the same problem in two different ways.

<table>
<thead>
<tr>
<th>Nathan’s Solution:</th>
<th>Patrick’s Solution:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[5(y + 1) = 3(y + 1) + 8]</td>
<td>[5(y + 1) = 3(y + 1) + 8]</td>
</tr>
<tr>
<td>[5y + 5 = 3y + 3 + 8]</td>
<td>[2(y + 1) = 8]</td>
</tr>
<tr>
<td>[5y + 5 = 3y + 11]</td>
<td>[2(y + 1) = 8]</td>
</tr>
<tr>
<td>[2y + 5 = 11]</td>
<td>[y + 1 = 4]</td>
</tr>
<tr>
<td>[2y = 6]</td>
<td>[\text{Divide} \quad \text{on Both}]</td>
</tr>
<tr>
<td>[y = 3]</td>
<td>[y = 3]</td>
</tr>
</tbody>
</table>

Complete the step labels for each solution in the blank spaces provided above.

9. Describe 2 ways that these students’ solution steps are different.
   (1)
   (2)

10. On a timed test, I would use ______________________’s way because:

GP2: Working with your partner, solve the following equation using Patrick’s way:
\[6(x + 2) = 4(x + 2) + 16\]
These two students solved the same problem in two different ways.

<table>
<thead>
<tr>
<th>Abby’s Solution:</th>
<th>Heather’s Solution:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[3(h - 2) + 5(h - 2) = 24]</td>
<td>[3(h - 2) + 5(h - 2) = 24]</td>
</tr>
<tr>
<td>[8(h - 2) = 24]</td>
<td>[3h - 6 + 5h - 10 = 24]</td>
</tr>
<tr>
<td>[h - 2 = 3]</td>
<td>[8h - 16 = 24]</td>
</tr>
<tr>
<td>[h = 5]</td>
<td>[8h = 40]</td>
</tr>
<tr>
<td>Combine [_________] on Both</td>
<td>Add [________] on Both</td>
</tr>
<tr>
<td>Divide [________] on Both</td>
<td>Divide [________] on Both</td>
</tr>
</tbody>
</table>

Complete the step labels for each solution in the blank spaces provided above.

11. Why might you choose Abby’s way to solve this problem?

12. What must be true about an equation for Abby’s way to be easier than Heather’s way?
SOLVE THESE PROBLEMS BY YOURSELF. You will solve each problem in **two ways**. Be sure to show your work. Next, check your answers with your partner. Last, raise your hand so a teacher can check your work.

\[
9 + 5(x + 1) = 8(x + 1)
\]

**Way 1**

\[
9 + 5(x + 1) = 8(x + 1)
\]

**Way 2**

\[
9 + 5(x + 1) = 8(x + 1)
\]

\[
2(y + 6) + 3(y + 6) = 25
\]

**Way 1**

\[
2(y + 6) + 3(y + 6) = 25
\]

**Way 2**

\[
2(y + 6) + 3(y + 6) = 25
\]
These two students solved the same problem in two different ways.

<table>
<thead>
<tr>
<th>Edward’s Solution:</th>
<th>Elizabeth’s Solution:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5(m + 4) = 2(m + 4) + 15$</td>
<td>$5(m + 4) = 2(m + 4) + 15$</td>
</tr>
<tr>
<td>$5m + 20 = 2m + 8 + 15$</td>
<td>$3(m + 4) = 15$</td>
</tr>
<tr>
<td>$5m + 20 = 2m + 23$</td>
<td>$m + 4 = 5$</td>
</tr>
<tr>
<td>$3m + 20 = 23$</td>
<td>$m = 1$</td>
</tr>
<tr>
<td>$3m = 3$</td>
<td>$3m = 3$</td>
</tr>
<tr>
<td>$m = 1$</td>
<td>$m = 1$</td>
</tr>
</tbody>
</table>

Complete the step labels for each solution in the blank spaces provided above.

13. To Solve $6(y + 3) = 4(y + 7) + 18$, whose first step would work? **Circle One:** Edward Elizabeth

Explain your reasoning:

14. Describe 2 ways that these students’ solution steps are similar.

(1)

(2)
These two students solved the same problem in two different ways.

<table>
<thead>
<tr>
<th>Jason’s Solution:</th>
<th>Emily’s Solution:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$21 = 7(x - 2)$</td>
<td>$21 = 7(x - 2)$</td>
</tr>
<tr>
<td>$\frac{3}{5} = x - 2$</td>
<td>$21 = 7x - 14$</td>
</tr>
<tr>
<td>$5 = x$</td>
<td>$35 = 7x$</td>
</tr>
<tr>
<td><strong>Divide _________ on Both</strong></td>
<td><strong>Distribute _________</strong></td>
</tr>
<tr>
<td><strong>Add _________ on Both</strong></td>
<td><strong>Add _________ on Both</strong></td>
</tr>
<tr>
<td><strong>Divide _________ on Both</strong></td>
<td><strong>Divide _________ on Both</strong></td>
</tr>
</tbody>
</table>

Complete the step labels for each solution in the blank spaces provided above.

15. Jason and Emily divided both sides by 7, but in different steps. Why is the divide step OK to do in either step?

16. How do you know if both ways to solve the problem are correct?
PLEASE STOP HERE AND WAIT UNTIL THURSDAY: DAY 3

Do you have the same partner as yesterday? Please circle one. **YES** or **NO**.

If not, please write your partner’s name here: ________________________________
These two students solved the same problem in two different ways.

**Todd’s Solution:**

\[
\frac{1}{4}(x + 8) = 5 \\
\frac{1}{4}x + 2 = 5 \\
\frac{1}{4}x = 3 \\
x = 12
\]

**Matthew’s Solution:**

\[
\frac{1}{4}(x + 8) = 5 \\
x + 8 = 20 \\
x = 12
\]

Complete the step labels for each solution in the blank spaces provided above.

17. Matthew’s way is easier than Todd’s way when:

18. Describe 2 ways these students’ solution steps are similar:
   (1)

   (2)

GP3: Working with your partner, solve the following equation using Matthew’s way:

\[
\frac{1}{5}(x - 4) = 2
\]
These two students solved the same problem in two different ways.

<table>
<thead>
<tr>
<th>Brianna’s Solution:</th>
<th>Caitlyn’s Solution:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$3(n - 2) + 12 = 6(n - 2)$</td>
<td>$3(n - 2) + 12 = 6(n - 2)$</td>
</tr>
<tr>
<td>$12 = 3(n - 2)$ Subtract __________</td>
<td>$3n - 6 + 12 = 6n - 12$ Distribute __________</td>
</tr>
<tr>
<td>$4 = n - 2$ Divide ______ on Both</td>
<td>$3n + 6 = 6n - 12$ Combine __________</td>
</tr>
<tr>
<td>$6 = n$ Add ______ on Both</td>
<td>$18 = 3n$ Subtract ______ on Both</td>
</tr>
<tr>
<td></td>
<td>$6 = 3n - 12$ Add ______ on Both</td>
</tr>
<tr>
<td></td>
<td>$6 = n$ Divide ______ on Both</td>
</tr>
</tbody>
</table>

Complete the step labels for each solution in the blank spaces provided above.

19. __________________________’s way is better on this problem because:

20. If the problem were $8(j + 2) = 4(j + 8) + 12$, whose first step would work? **Circle One:** Brianna Caitlyn

Explain your reasoning.
SOLVE THESE PROBLEMS BY YOURSELF. You will solve each problem in **two ways**. Be sure to show your work. Next, check your answers with your partner. Last, raise your hand so a teacher can check your work.

Way 1

\[ \frac{1}{6}(x + 1) = 1 \]

Way 2

\[ \frac{1}{6}(x + 1) = 1 \]

\[ 4(x - 3) = 2(x - 3) + 10 \]

Way 1

\[ 4(x - 3) = 2(x - 3) + 10 \]

Way 2

\[ 4(x - 3) = 2(x - 3) + 10 \]
These two students solved the **same problem in two different ways**.

<table>
<thead>
<tr>
<th>Dominic’s Solution:</th>
<th>Jarrod’s Solution:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ 9 = 3(y + 5) + 6(y + 5) ]</td>
<td>[ 9 = 3(y + 5) + 6(y + 5) ]</td>
</tr>
<tr>
<td>[ 9 = 3y + 15 + 6y + 30 ] Distribute ___________\</td>
<td>[ 9 = 9(y + 5) ] Combine ___________\</td>
</tr>
<tr>
<td>[ 9 = 9y + 45 ] Combine ___________\</td>
<td>[ 1 = y + 5 ] Divide ___________\ on Both</td>
</tr>
<tr>
<td>[ -36 = 9y ] Subtract ___________\ on Both</td>
<td>[ -4 = y ] Subtract ___________\ on Both</td>
</tr>
<tr>
<td>[ -4 = y ] Divide ___________\ on Both</td>
<td></td>
</tr>
</tbody>
</table>

Complete the step labels for each solution in the blank spaces provided above.

21. Why might you choose Jarrod’s way to solve this problem?

22. What must be true about an equation for Jarrod’s way to be easier than Dominic’s way?
These two students solved the same problem in two different ways.

<table>
<thead>
<tr>
<th>Peter’s Solution:</th>
<th>Tina’s Solution:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2(t - 1) + 20 = 7(t - 1)$</td>
<td>$2(t - 1) + 20 = 7(t - 1)$</td>
</tr>
<tr>
<td>$20 = 5(t - 1)$</td>
<td>$2t - 2 + 20 = 7t - 7$</td>
</tr>
<tr>
<td>Subtract _________</td>
<td>Distribute _________</td>
</tr>
<tr>
<td>$4 = t - 1$</td>
<td>$2t + 18 = 7t - 7$</td>
</tr>
<tr>
<td>Divide _________ on Both</td>
<td>Combine _________</td>
</tr>
<tr>
<td>$5 = t$</td>
<td>$18 = 5t - 7$</td>
</tr>
<tr>
<td>Add _________ on Both</td>
<td>Subtract _________ on Both</td>
</tr>
<tr>
<td></td>
<td>$25 = 5t$</td>
</tr>
<tr>
<td></td>
<td>Add _________ on Both</td>
</tr>
<tr>
<td></td>
<td>$5 = t$</td>
</tr>
<tr>
<td></td>
<td>Divide _________ on Both</td>
</tr>
</tbody>
</table>

Complete the step labels for each solution in the blank spaces provided above.

23. Describe 2 ways these students’ solutions are different:

(1)

(2)

24. On a timed test, I would use _____________________’s way because: