

130 WORKSHEET (5.3)

Name _____

Identify the property of integers shown.

1. $(3 + -3) + 7 = 0 + 7$

6. $5 + 9 = 9 + 5$

2. $4(9 - 3) = 4 * 9 - 4 * 3$

7. $(4 * 1) * 7 = 4 * 7$

3. $5 + 0 = 5$

8. $8 + (-8) = 0$

4. $5 + (7 + 9) = (5 + 7) + 9$

9. $8 * (3 * 4) = (8 * 3) * 4$

5. $5 * 6 = 6 * 5$

10. $5 * 1 = 5$

11. The first three problems are worked by a student with a misconception. Complete the remaining two problems using the error pattern and describe the error pattern.

$4 - 6 = \underline{2}$ $8 - 11 = \underline{3}$ $2 - 7 = \underline{5}$

$6 - 10 = \underline{\hspace{2cm}}$ $10 - 12 = \underline{\hspace{2cm}}$

12. In general integer subtraction is not commutative. However, can you find a value for a and b so that $a - b = b - a$? What relationship must a and b have?

13. Look at the system below for addition in Mod 4.

| | | | | |
|---|---|---|---|---|
| + | 0 | 1 | 2 | 3 |
| 0 | 0 | 1 | 2 | 3 |
| 1 | 1 | 2 | 3 | 0 |
| 2 | 2 | 3 | 0 | 1 |
| 3 | 3 | 0 | 1 | 2 |

- A. Is the system closed under addition? How do you know?
- B. Is there an identity element for the system? What is it?
- C. Does every element of the system have an inverse? Explain.
- D. Is the system commutative? Explain.
14. Look at the system below for division in Mod 4. Note: -- means that computation is undefined.

| | | | | |
|---|----|---|-----|----|
| ÷ | 0 | 1 | 2 | 3 |
| 0 | -- | 0 | 0,2 | 0 |
| 1 | -- | 1 | -- | -- |
| 2 | -- | 2 | 1 | -- |
| 3 | -- | 3 | -- | 1 |

- A. Is the system closed under division? How do you know?
- B. Is there an identity element for the system? What is it?
- C. Does every element of the system have an inverse? Explain.
- D. Why are there two answers for $0 \div 2$?