

1-4 Enrichment

Which of the properties of real numbers are illustrated by the following situations? Explain your reasoning.

1. One team scores 3 runs in the first inning and 2 runs in the fourth inning. The other team scores 2 runs in the first inning and 3 runs in the fourth. In the fifth inning, the score is tied.
2. Your friend gets a job making \$9.50 per hour. One week she takes a vacation and does not work. She makes no money that week.
3. In putting together a mixture of fertilizer, a gardener mixes nitrogen and phosphorus before adding potassium. The next day the gardener mixes phosphorus and potassium before adding nitrogen. The two mixtures are exactly the same.
4. A restaurant received two orders from the apartment managers of two different apartment buildings. The first apartment manager said he was ordering 3 meals each for the occupants of 4 different apartments. The second said he was ordering 4 meals each for the occupants of 3 different apartments. The apartment managers ordered the same number of meals.
5. The owner of a theater checked how much money was in the box office 10 minutes before a show began. No tickets were purchased in the last 10 minutes, so the owner was not surprised that the final amount of money was the same as when he previously checked.
6. Usually, when Marty makes pancakes for his kids, he changes the amount of each ingredient depending on how many servings he is making. Since he was making the exact number of servings the recipe called for, he was able to use the numbers published in the cook book.
7. **Open-Ended** Provide examples to show the following.
 - a. The associative property of addition holds true for negative integers.
 - b. The commutative property of multiplication holds true for non-integers.
 - c. The multiplicative property of negative one holds true regardless of the sign of the number on which the operation is performed.
 - d. The commutative property of multiplication holds true if one of the factors is zero.

Name the property that each statement illustrates.

8. $12 + 917 = 917 + 12$

9. $74.5 \cdot 0 = 0$

10. $35 \cdot x = x \cdot 35$

11. $3 \cdot (-1 \cdot p) = 3 \cdot (-p)$

12. $m + 0 = m$

13. $53.7 \cdot 1 = 53.7$

14. $(35 + 8) + 12 = 35 + (8 + 12)$

15. $(32 \cdot 5) \cdot 2 = 32 \cdot (5 \cdot 2)$

16. $m + (-m) = 0$

17. $\frac{6}{7} \cdot \frac{7}{6} = 1$