

Algebra 1 - Properties of Real Numbers

Name: _____

Find the additive inverse of each number.

1. 15 2. -27 3. $\frac{7}{9}$ 4. $-\frac{9}{16}$ 5. 0 6. -1

Find the multiplicative inverse of each number.

7. 15 8. -27 9. $\frac{7}{9}$ 10. $-\frac{9}{16}$ 11. 1 12. $\frac{1}{8}$

Determine which properties of real numbers that is applied in each statement in exercise 13 – 30.

The properties of real numbers are:

- Commutative property of addition
- Commutative property of multiplication
- Associative property of addition
- Associative property of multiplication
- Additive identity
- Additive inverse
- Multiplicative identity
- Multiplicative inverse
- Distributive property

13. $43 + 25 = 25 + 43$

14. $(8 \cdot 5) \cdot 10 = 8 \cdot (5 \cdot 10)$

15. $3 + 5 + 8 = 3 + 8 + 5$

16. $5 + (6 + 2) = (5 + 6) + 2$

17. $12 \cdot 5 = 5 \cdot 12$

18. $4(5 + 3) = 4 \cdot 5 + 4 \cdot 3$

19. $3 \cdot 5 - 3 \cdot 2 = 3(5 - 2)$

20. $7 + (5 + 3) = 7 + (3 + 5)$

21. $-47 + 47 = 47 + (-47) = 0$

22. $2 \cdot 5 \cdot 4 \cdot 7 = 2 \cdot 5 \cdot 7 \cdot 4$

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23. $7 + (-7) = 0$

24. $18 + 0 = 18$

25. $(13 + 7) \cdot 10 = 13 \cdot 10 + 7 \cdot 10$

26. $(-5) \cdot 1 = -5$

27. $9 \cdot \frac{1}{9} = 1$

28. $(6 \cdot 4) \cdot 3 = (4 \cdot 6) \cdot 3$

29. $-\frac{5}{7} \cdot (-\frac{7}{5}) = 1$

30. $(4 + 10) + 6 = 10 + (4 + 6)$

31. $(2 \cdot 5)(3 + 6) = (5 \cdot 2)3 + (5 \cdot 2)6$

Use the indicated properties of real numbers to complete the blanks of the following statements.

32. $50 + 43 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$

Commutative property of Addition

33. $5 + (7 + 6) = (\underline{\hspace{2cm}} + \underline{\hspace{2cm}}) + \underline{\hspace{2cm}}$

Associative property of Addition

34. $-15 + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Additive Identity

35. $\frac{3}{4} \cdot \underline{\hspace{2cm}} = 1$

Multiplicative Inverse

36. $25 \cdot 4 = \underline{\hspace{2cm}}$

Commutative property of Multiplication

37. $7 \cdot (8 \cdot 5) = \underline{\hspace{2cm}}$

Associative property of Multiplication

38. $11 \cdot (14 + 16) = \underline{\hspace{2cm}}$

Distributive property

39. $(14 - 20)3 = \underline{\hspace{2cm}}$

Distributive property

40. $(4 \cdot 12) \cdot 5 = \underline{\hspace{2cm}}$

Associative property of Multiplication

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41.) Simplify by **combining like terms**.

a.) $6x + 5 + 2x + 8$

b.) $-4x - 10 + 3x - 4x$

c.) $-17 - 3x - 3x + 2$

d.) $3xy + 5xy + 8 - 15$

e.) $5a^2 - 9a^2 + 3 - 8$

f.) $21 + 5 - 18 + 2x - 7x$

42.) Use the **distributive property** (rainbow) to simplify the following problems.

a.) $3(6 \text{ cats} + 4 \text{ dogs})$

b.) $2(3 \text{ cups sugar} + 2 \text{ eggs})$

c.) $4(6 \text{ pens} + 4 \text{ erasers})$

d.) $5(w + 2)$

e.) $4(z - 5)$

f.) $-8(x + 2)$

g.) $(5x - 2)(-7)$

h.) $-(3 - 2x)$

i.) $5(\$6x + \$8y + z)$

j.) $-3(5x - 4y + z - 9)$

43.) Distribute and then combine like terms:

These should have at least one line of work before your answer!!!!

a.) $2(3x + 1) + x$

b.) $-2(3a - 5) + 2a$

c.) $(5m + 2)(-4) + 12$

44.) Answer the following questions about this expression: $6x^2 - 3y - z + 11$

a.) What is the coefficient of the 3rd term? _____

b.) What is the constant? _____

c.) What is the variable of the 2nd term? _____

d.) What is the exponent on the variable of the 1st term? _____

