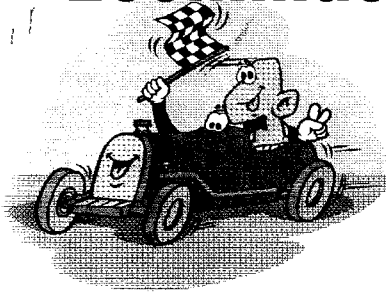


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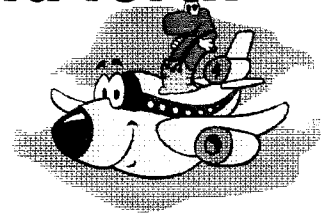
Copy into notebook as we go through each excersize

Commutative Property

1commute : to travel back and forth



regularly



Addition

$$5 + (-15) = (-15) + 5$$

$$-10 = -10$$

Yes numbers may travel

example:

$$5 + 6 + (-9) = 6 + 5 + (-9)$$
$$2 = 2$$

Subtraction

—

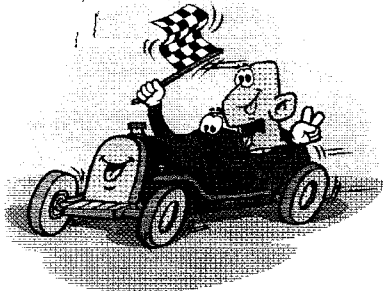
$$5 - (-15) \neq (-15) - 5$$
$$20 \neq -20$$

NO !!!! Numbers may NOT travel

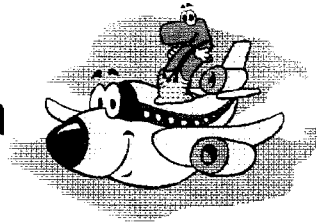
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Commutative Property



Multiplication

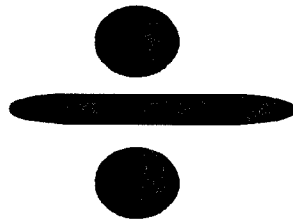


$$5(-15) = -15(5)$$
$$-75 = -75$$

Yes numbers may travel

example: $5(6)(-9) = 6(5)(-9)$
 $-270 = -270$

Division



$$-15 \div 5 = 5 \div -15$$
$$-3 \neq 0.33$$

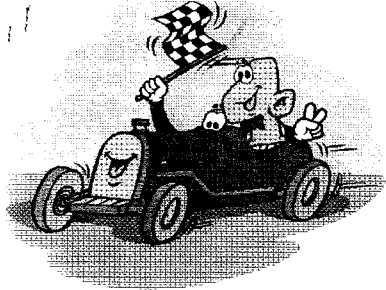
NO !!!! Numbers may NOT travel

Do NOT Write On Leave for next class

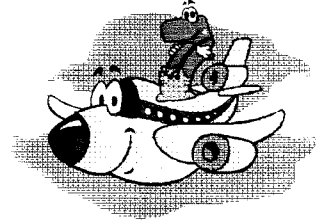
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Commutative Property

1. commute : to travel back and forth



regularly



Answer the following Questions in your notebook:

1.) For what two operations is it ok for the numbers to travel?

&

2.) The commutative property works for what two operations?

&

3.) Write an example of the commutative property for addition.

4.) Write an example of the commutative property for multiplication.

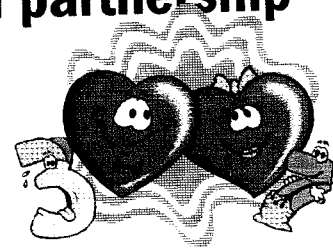
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Copy into notebook as we go through each exercise

Associative Property

associate 1 : to join in companionship or partnership

2 : to befriend.



Addition

$$\begin{array}{r} (5 + 3) + 7 = 5 + (3 + 7) \\ 8 + 7 = 5 + 10 \\ 15 = 15 \end{array}$$

Yes numbers can change partners !!!!

example:

$$\begin{array}{r} (3 + 12) + 9 = 3 + (12 + 9) \\ 15 + 9 = 3 + 21 \\ 24 = 24 \end{array}$$

Subtraction

→ $(25 - 10) - 5$ think of as 3 terms
 $(25) + (-10) + (-5)$

$$\begin{array}{r} 25 - 10 - 5 \\ (25 - 10) - 5 \neq 25 - (10 - 5) \\ 15 - 5 \neq 25 - 5 \\ 10 \neq 20 \end{array}$$

NO !!!! Numbers may NOT change partners

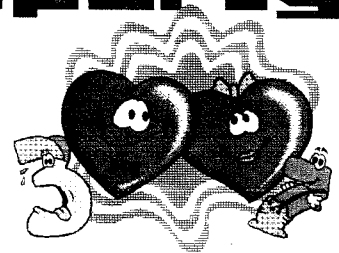
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Associative Property Multiplication



$$5 \times 3 \times 7$$



$$\begin{aligned} (5 \times 3) \times 7 &= 5 \times (3 \times 7) \\ 15 \times 7 &= 5 \times 21 \\ 105 &= 105 \end{aligned}$$

Yes numbers can change partners !!!!

example:

$$(3 \times 12) \times 9 = 3 \times (12 \times 9)$$

$$36 \times 9 = 3 \times 108$$

$$324 = 324$$

Division

$$96 \div 8 \div 2$$

$$(96 \div 8) \div 2 \neq 96 \div (8 \div 2)$$

$$12 \div 2 \neq 96 \div 4$$

$$6 \neq 24$$

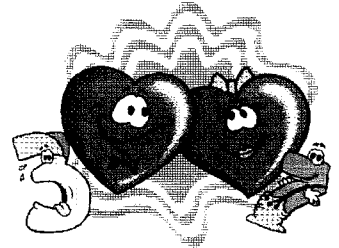
NO !!!! Numbers may **NOT** change partners

Do NOT Write On Leave for next class

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Associative Property

associate 1 : to join in companionship or partnership

2 : to befriend.



Answer the following Questions in your notebook:

1.) For what two operations is it ok for the numbers to change partners?

&

2.) The associative property works for what two operations?

&

3.) Write an example of the associative property for addition.

4.) Write an example of the associative property for multiplication.

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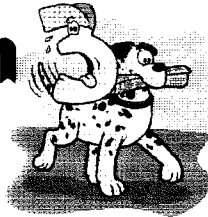
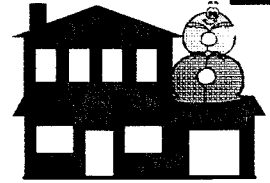
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Distributive Property

distribute 1 : to deliver to several or many

2 : to spread out : scatter; also : deliver .

Multiplication over Addition



$$3 (8 + 2) =$$

$$3 (8) + 3 (2) =$$

$$24 + 6 =$$

$$30$$

Check: using
order of
operations

$$3 (8 + 2) =$$

$$3 (10) =$$

$$30$$

example:

Use the distributive property
to solve

$$7 (4 + 2 + 10) =$$

$$7 (4) + 7 (2) + 7 (10) =$$

$$28 + 14 + 70 =$$

$$112$$

Check using
Order of operation:

$$7 (4 + 2 + 10) =$$

$$7 (16) =$$

$$112$$

Do NOT Write On Leave for next class

Copy into notebook as we go through each exercise

Distributive Property

distribute 1 : to deliver to several or many

2 : to spread out : scatter; also : deliver .

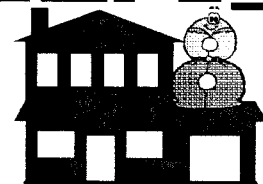
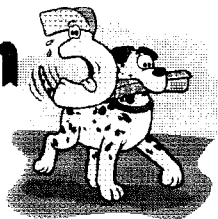
Multiplication over Subtraction

$$3 (8 - 2) =$$

$$3 (8) - 3 (2) =$$

$$24 - 6 =$$

$$18$$



**Check: using
order of
operations**

$$3 (8 - 2) =$$

$$3 (6) =$$

$$18$$

example:

**Use the distributive property
to solve**

$$7 (4 - 2 - 10) =$$

$$7 (4) - 7 (2) - 7 (10) =$$

$$28 - 14 - 70 =$$

$$-56$$

**Check using
Order of operations**

$$7 (4 - 2 - 10) =$$

$$7 (-8) =$$

$$-56$$

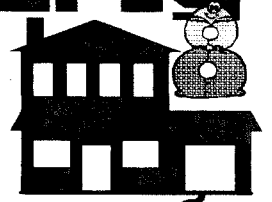
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Distributive Property

distribute 1 : to deliver to several or many

2 : to spread out : scatter; also : delive



**Answer the following Questions
in your notebook:**

**1.) The problem below illustrates the distribution of
over**

$$\begin{aligned}5(6 + 3) &= \\5(6) + 5(3) &= \\30 + 15 &= \\45 &= \end{aligned}$$

**2.)The problem below illustrates the distribution of
over**

$$\begin{aligned}5(6 - 3) &= \\5(6) - 5(3) &= \\30 - 15 &= \\15 &= \end{aligned}$$

**3.) Solve the following by using the distributive property
Then check using order of operations.**

$$8(4 + 12) =$$

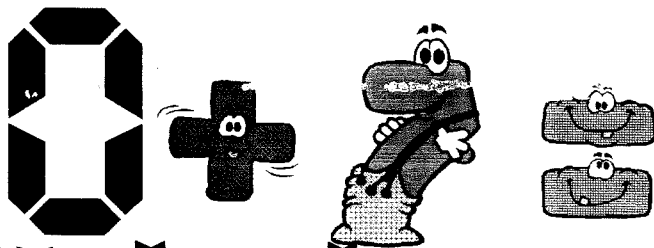
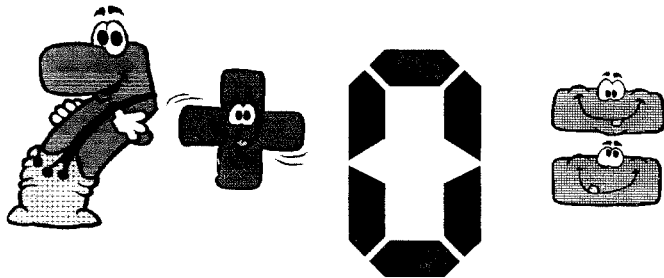
**4.) Solve the following by using the distributive property
Then check using order of operations.**

$$5(9 - 15) =$$

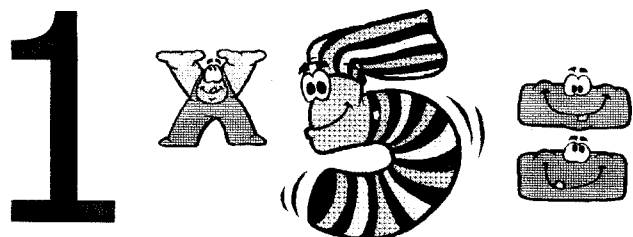
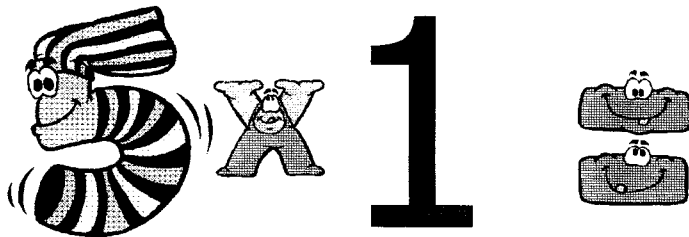
Identity

identity 1 : individuality, the fact of being the same person or thing as claimed

Additive identity The number zero



Multiplicative identity The number one



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Identity

identity 1 : individuality, the fact of being the same person or thing as claimed

**Answer the following Questions
in your notebook:**

1.) What number is called the additive identity? _____

**In one or two sentences explain why it is called the additive identity.
Then give an example using numbers.**

2.) What number is called the multiplicative identity? _____

**In one or two sentences explain why it is called the additive identity.
Then give an example using numbers.**

Do NOT Write On Leave for next class
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Multiplying Integers Long Problems

$$-8(5)(-3)(-2) =$$

Step 1
Multiply Numbers

$$8 \times 5 \times 3 \times 2 =$$

Step 2
Multiply Negatives

$$-8(5)(-3)(-2) =$$

$- \quad X \quad - \quad X \quad -$

Cancel out pairs

*because
neg x neg = pos*

Everything cancels:

Answer positive

1 negative sign left :

answer negative

$$-8(5)(-3)(-2) =$$

*Even # of negatives \rightarrow answer positive
Odd # of negatives \rightarrow answer negative*

Do NOT Write On Leave for next class

Copy into notebook as we go through each exercise

Dividing Integers

Writing Division problems

$$63 \div 9 = \frac{63}{9}$$

$$\frac{15}{5} = 15 \div 5$$

$$\frac{-18}{-6} =$$

Step 1

Divide Numbers

$$18 \div 6 =$$

Step 2

Like or Unlike?????

Like: answer positive

$$\frac{-18}{-6} =$$

Unlike: answer negative

Do NOT Write On Leave for next class
Copy into notebook as we go through each excersize

Dividing Integers

Long Problems

$$72 \div (-9) \div (-2) =$$

Step 1

Divide Numbers

Must Divide from Left to Right

$$72 \div 9 \div 2 =$$

Step 2

Divide Negatives

$$72 \div \underset{\downarrow}{(-9)} \div \underset{\downarrow}{(-2)} =$$

Cancel out pairs

Everything cancels:

Answer positive

1 negative sign left :

answer negative

$$72 \div (-9) \div (-2) =$$