2024-2025

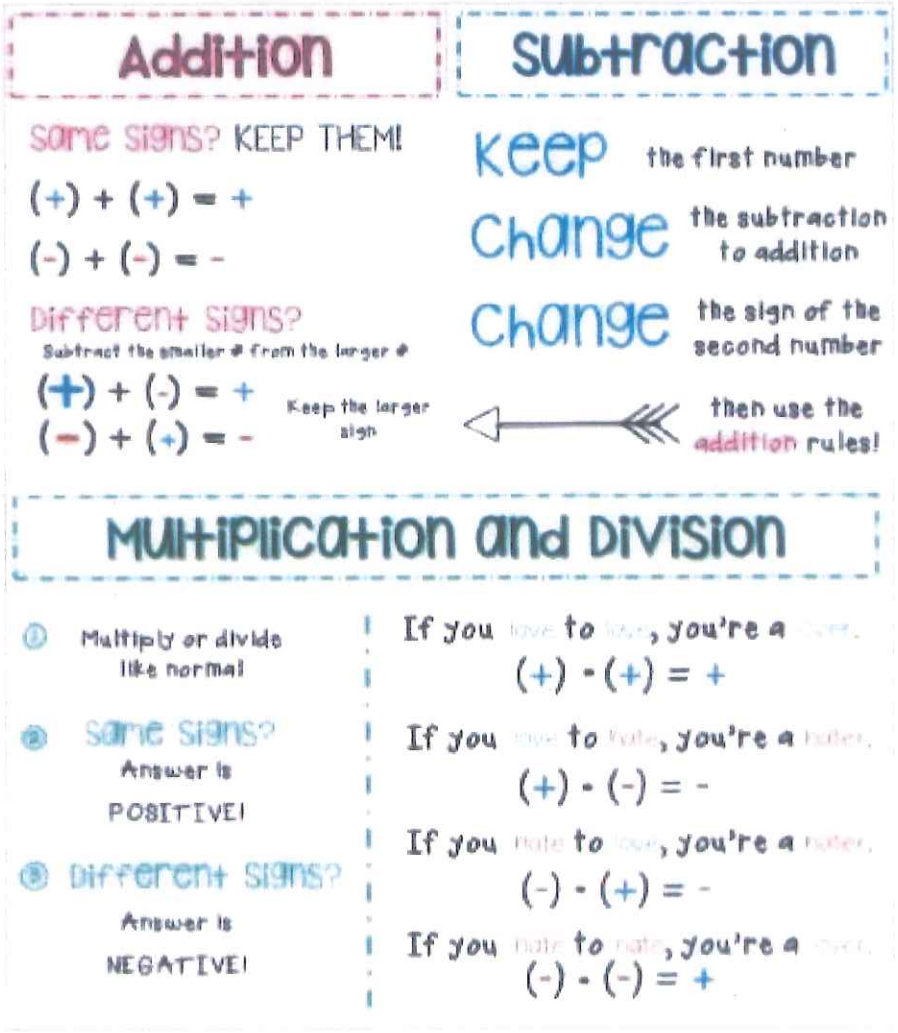
EIGHTH GRADE MATH SUMMER PACKET

This packet will be due the first week of school and it will be graded.
Please use pencil only and remember: **NO WORK, NO CREDIT!**

Name: _____

Teacher: _____

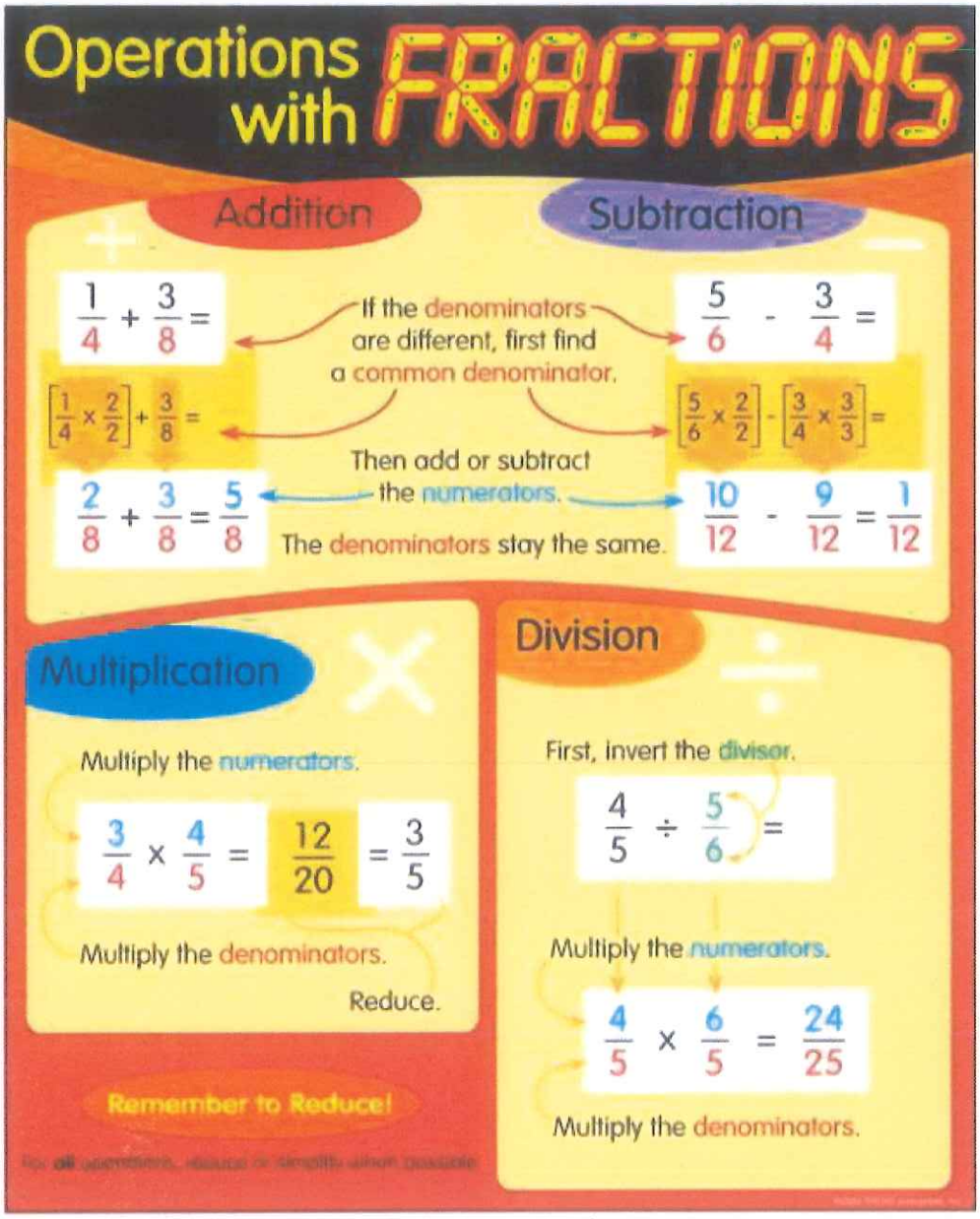
Skill #1: Operations with Integers



** Note: Try to do these WITHOUT a calculator first. Then use it to verify your answers.**

Now try these problems

1. 46 + (-13)
2. -16 + (-2)
3. -13 - (-16)
4. 13 - (-13)
5. -12 (-5)
6. $\frac{30}{-15} =$



Now try these problems

1. 3/5 + 1/5

2. 5/7 – 2/7

3. 2/4 × 1/9

4. 3/7 + 4/5

Skill #1: Simplifying Numerical Expressions

To simplify numerical expressions, you must follow order of operations.

ORDER →

always work LEFT to RIGHT

- **P**arentheses ( )
- **E**xponents x^3
- **M**ultiply × OR **D**ivide ÷
- **A**ddition + OR **S**ubtraction −

PRACTICE:

$3+7\times6\div3=$	$(6\times4)\div3-6+2=$	$2^2\times9\div3=$
$3+42\div3=$	$24\div3-6+2=$	$4\times9\div3=$
$3+14=$	$8-6+2=$	$36\div3=$
17	$2+2=$	12
	4	

P	Please	Parentheses
E	Excuse	Exponents
M	My	Multiply
D	Dear	Divide
A	Aunt	Addition
S	Sally	Subtraction

Now try these problems

1. $7 + (6 \times 5^2 + 3)$
2. $3 + 6 \times (5 + 4) \div 3 - 7$
3. $(8-1)\times(5-4)$
4. $9-(3-8\div4\div(1\times1))$
5. $(8-7)\times(2+1)+1$
6. $16 \div 2[8 - 3(4 - 2)] + 1$

Skill #1: Distribution

The Distributive Property**

Definition: For any numbers a, b, and c,

a (b + c) = ab + ac and (b + c) a = ba + ca;

a (b – c) = ab – ac and (b – c) a = ba – ca;

Example:
10 (x + 2) = 10x + 10(2) = 10x + 20

** Make sure to take a look at the signs!**

$8(x + 3) = 8x + 24$

$2x(5x - 7) = 10x^2 - 14x$

$-3(x^2 + 4x - 2) = -3x^2 - 12x + 6$

Skill #2: Combining Like Terms

Like Terms

Like terms have the same variables to the same power.

Like terms can be combined.

Like Terms	Unlike Terms
$2x, -5x$	$6x, 5y$
$a, \frac{1}{2}a$	y, y^2
$-2x^2, 8x^2$	$x, 7$

Combine like terms.

A. $2x + 5x - 4y + 3$

$2x + 5x - 4y + 3$ — *Identify like terms.*

$7x - 4y + 3$ — *Combine coefficients: 2 + 5 = 7*

B. $9d + 7c - 4d - 2c$

$9d + 7c - 4d - 2c$ — *Identify like terms.*

$5d + 5c$ — *Combine coefficients: 9 – 4 = 5 and 7 – 2 = 5*

C. $8g + c - 6$

$8g + c - 6$ — *No like terms.*

Putting the two concepts together:

$3(x+2) - 6(x+1) =$

$3(x) + 3(2) - 6(x) - 6(1) =$

$3x + 6 - 6x - 6 =$

$-3x$

Now try these problems

1. $4(2x + 2) =$
2. $-2x - 3 + 4x + 5x + 6 =$
3. $-3(x - 3) =$
4. $3y - 2y + 5 + y - 2 =$
5. $3(x + 2) + 2(2x + 1) =$
6. $-4(x - 1) + 2(x - 2) =$

Independent Practice:

Simplify each expression.

43) $-6(7n + 5) - 7n$

44) $-10(a + 10) + 2a$

45) $9 - 4(k - 1)$

46) $-9 + 3(7x + 4)$

47) $3 - 3(4x - 3)$

48) $-9(4 - 2m) - 9(1 - 3m)$

49) $10(3 - 7a) + 5(1 - 7a)$

50) $10(7 - 6n) - (2n - 10)$

51) $9(1 + 10n) - 6(n + 8)$

52) $-2(7x + 9) + 6(-4x - 6)$

Skill #1: Solving Two-Step Equations

You can solve equations by *isolating* the variable using inverse operations:

INVERSE OPERATION

Operation	+	-	x	÷
Inverse	-	+	÷	x
Example	6+4= 10 10-4= 6	28-10= 18 18+10= 28	7x3= 21 21÷3= 7	50÷10= 5 5x10= 50

$$2x+5=21$$
$$2x+5-5=21-5$$
$$2x=16$$
$$\frac{2x}{2}=\frac{16}{2}$$
$$x=8$$

Now try these problems

1. $3b+9=-18$
2. $3z-2=-26$
3. $2x+8=4$
4. $-2y-6=6$
5. $2a+9=11$
6. $3y-5=-32$

Independent Practice:

Solve each equation.

53) $-1 = \frac{-5 + v}{14}$

54) $\frac{-9 + x}{7} = -2$

55) $\frac{9 + v}{5} = 3$

56) $44 = -2n + 10$

57) $1 + \frac{x}{8} = 3$

58) $4 + \frac{n}{6} = 2$

59) $0 = -1 + \frac{a}{10}$

60) $\frac{n}{4} + 2 = 1$

61) $-2 + \frac{v}{6} = 1$

62) $\frac{x + 1}{14} = -1$

STEPS TO SOLVING MULTI-STEP EQUATIONS

STEP 1: Distribute.

STEP 2: Combine Like Terms on each side.

STEP 3: Move variables to one side.

STEP 4: Move constants to the other side.

STEP 5: Multiply by the denominator/Divide by coefficient

$$-3x - 32 = -2(5 - 4x)$$
$$-3x - 32 = -10 + 8x$$
$$-3x + 3x - 32 = -10 + 8x + 3x$$
$$-32 = -10 + 11x$$
$$-32 + 10 = -10 + 10 + 11x$$
$$-22 = 11x$$
$$\frac{-22}{11} = \frac{11x}{11}$$
$$-2 = x$$

Now try these problems

1. $7 - 2x = x - 14$

2. $3y + 8 = 2y - 7$

3. $6 - 4x = 16 - 9x$

4. $3.6y = 5.4 + 3.3y$