

WORKING WITH SIGNED NUMBERS

Terms to Know

- *Operation* means add, subtract, multiply, or divide.
- Before you do any computation, *determine the operation* and then follow instructions for that operation.

Addition

- Ask: *Do the numbers have the same sign?*
- Answer: Yes → Find the *sum*

$$\begin{array}{l} (-6) + (-3) = (-9) \\ 6 + 3 = 9 \end{array}$$
- Answer: No → Find the *difference* and use the sign of the larger number.

$$\begin{array}{l} (-6) + (3) = (-3) \\ (-3) + (6) = 3 \end{array}$$
- Practice:

$$(7) + (-4) =$$

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

$$(-7) + (4) =$$

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

$$(11) + (-16) =$$

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

$$(-11) + (16) =$$

$$(15) + (-12) =$$

$$(-11) + (-16) =$$

$$(-15) + (12) =$$

Subtraction

- Subtraction means *add the opposite* of the second number.
- Examples:

$$\begin{array}{l} 6 - 3 \rightarrow 6 + (-3) = 3 \\ 6 - (-3) \rightarrow 6 + 3 = 9 \\ (-6) - 3 \rightarrow (-6) + (-3) = -9 \\ (-6) - (-3) \rightarrow (-6) + 3 = -3 \end{array}$$

- Practice:

$$(2) - (-4) =$$

$$(10) - (-10) =$$

$$(-6) - (-5) =$$

$$(-10) - (10) =$$

$$(15) - (-10) =$$

$$(-10) - (-10) =$$

$$(-15) - (10) =$$

$$(-12) - (4) =$$

$$(-15) - (-10) =$$

$$(12) - (-4) =$$

Multiplication and Division

- First, *do* the computation (ignore the signs)
- Next, *determine* the sign by counting the number of *negative* signs:
Even number of signs → answer is positive
Odd number of signs → answer is negative

- Multiplication Examples:

$$(-6) \times 4 \rightarrow 6 \times 4 = 24$$

do computation

1 negative sign (odd = negative)

count negative signs

$$(-6) \times 4 = (-24)$$

answer is negative

$$(-6) \times (4) \times (-2) \rightarrow 6 \times 4 \times 2 = 48$$

compute

2 negative signs (even = positive)

count

$$(-6) \times (4) \times (-2) = 48$$

answer

$$(-6) \times (-4) \times (-2) \rightarrow 6 \times 4 \times 2 = 48$$

compute

3 negative signs (odd = negative)

count

$$(-6) \times (-4) \times (-2) = (-48)$$

answer

- Practice

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

$$(2) \times (-2) \times (3) =$$

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

$$(-2) \times (-2) \times (-3) =$$

$$(-2) \times (-3) \times (4) =$$

$$(-2) \times (2) \times (-3) =$$

$$(2) \times (-3) \times (4) =$$

$$(9) \times (-2) \times (2) =$$

$$(2) \times (-3) \times (-4) =$$

$$(-9) \times (2) \times (2) =$$

$$(-2) \times (-3) \times (-4) =$$

$$(9) \times (-2) \times (-2) =$$

- Division Examples:

$$(-8) \div (2) \rightarrow 8 \div 2 = 4 \quad \text{compute}$$

1 negative sign (odd = negative) count

$$(-8) \div (2) = (-4) \quad \text{answer}$$

$$(-16) \div (-4) \rightarrow 16 \div 4 = 4 \quad \text{compute}$$

2 negative signs (even = positive) count

$$(-16) \div (-4) = 4 \quad \text{answer}$$

- Division Practice

$$(-18) \div (9) =$$

$$(-10) \div (2) =$$

$$(-9) \div (3) =$$

$$(-36) \div (-3) =$$

$$(-18) \div (-9) =$$

$$(-45) \div (9) =$$

$$(-9) \div (-3) =$$

$$(-45) \div (-5) =$$

$$(24) \div (-2) =$$

$$(40) \div (-8) =$$

$$(-24) \div (-2) =$$

$$(-25) \div (5) =$$

Make up your own questions based on areas of difficulty.

Answers to Practice Questions

Addition

$$(7) + (-4) = (3)$$

$$(-7) + (4) = (-3)$$

$$(11) + (-16) = (-5)$$

$$(-11) + (16) = (5)$$

$$(-11) + (-16) = (-27)$$

$$(-9) + (-6) = (-15)$$

$$(9) + (-6) = (3)$$

$$(-9) + (6) = (-3)$$

$$(15) + (-12) = (3)$$

$$(-15) + (12) = (-3)$$

Subtraction

$$(2) - (-4) = (6)$$

$$(-6) - (-5) = (-1)$$

$$(15) - (-10) = (25)$$

$$(-15) - (10) = (-25)$$

$$(-15) - (-10) = (-5)$$

$$(10) - (-10) = (20)$$

$$(-10) - (10) = (-20)$$

$$(-10) - (-10) = (0)$$

$$(-12) - (4) = (-16)$$

$$(12) - (-4) = (16)$$

Multiplication

$$(9) \times (-3) = (-27)$$

$$(-9) \times (-3) = (27)$$

$$(-2) \times (-3) \times (4) = (24)$$

$$(2) \times (-3) \times (4) = (-24)$$

$$(2) \times (-3) \times (-4) = (24)$$

$$(-2) \times (-3) \times (-4) = (-24)$$

$$(2) \times (-2) \times (3) = (-12)$$

$$(-2) \times (-2) \times (-3) = (-12)$$

$$(-2) \times (2) \times (-3) = (12)$$

$$(9) \times (-2) \times (2) = (-36)$$

$$(-9) \times (2) \times (2) = (-36)$$

$$(9) \times (-2) \times (-2) = (36)$$

Division

$$(-18) \div (9) = (-2)$$

$$(-9) \div (3) = (-3)$$

$$(-18) \div (-9) = (2)$$

$$(-9) \div (-3) = (3)$$

$$(24) \div (-2) = (-12)$$

$$(-24) \div (-2) = (12)$$

$$(-10) \div (2) = (-5)$$

$$(-36) \div (-3) = (9)$$

$$(-45) \div (9) = (-5)$$

$$(-45) \div (-5) = (9)$$

$$(40) \div (-8) = (-5)$$

$$(-25) \div (5) = (-5)$$