Section 2.3 Subtraction with Negative Numbers

1. Definition of Subtraction: If a and b are any two numbers, then it is true that:

$$a - b = a + (-b)$$

Subtracting a number is the same as adding its opposite.

Example 1: Write each of the given subtraction problems as an equivalent addition problem using the definition of subtraction.

a. $14 - 7 = 14 + (-7)$

b. $9 - (-4) = 9 + [-(-4)] = 9 + 4$

c. $-13 - 5$

d. $17 - 9$

e. $-15 - (-4)$

f. $17 - (-6)$

2. Subtraction with Negative Numbers: To subtract two numbers, rewrite the expression as "addition of the opposite", and then apply the addition rules.

Example 2: Simplify.

a. $-7 - 5$

$= -7 + (-5)$ change subtraction to addition of the opposite

$= -12$ apply rule for adding

b. $-8-(-5)$

$= -8+[-(-5)]$ change subtraction to addition of the opposite

$=$ apply rule $-(-a)=a$

$=$ apply rule for adding numbers that have different signs

Example 3: Simplify each of the following.

a. $17-(-10)$

b. $-3-10$

c. $4-10$

Practice Problems:
Rewrite as equivalent addition expressions

a. $-14-8$
b. $-13-(-3)$
c. $35-(-4)$

Simplify by rewriting as an equivalent addition expression and then applying the addition rules.

d. $-15-(-4)$
e. $-18-14$
f. $15-32$

Answers:

a. $-14+(-8)$
b. $-13+[-(-3)]=-13+3$
c. $35+[-(-4)]=35+4$
d. –11
e. –32
f. –17

Note: Portions of this document are excerpted from the textbook *Prealgebra,* 6th ed. by Charles McKeague