Algebra IA

Warm-Up
Tell which Addition Property is shown in each of the following.

(a)　$5+(-5)=0$　Inverse Property

(b)　$7+(-3)=-3+7$　Commutative Property

(c)　$(x+9)+(-3)=x+(9+(-3))$
　　Associative Property

(d)　$-15+0=-15$

　　Identity Property

Properties of Addition	
Commutative Property	$a+b=b+a$
Associative Property	$(a+b)+c=a+(b+c)$
Identity Property	$a+0=a$
Inverse Property	$a+(-a)=0$

Example 1. Subtract Real Numbers
Find the difference by rewriting with the **subtraction rule**.

(a)　$-18-3$
　　$-18+(-3) = \boxed{-21}$

(b)　$-9-(-12)$
　　$-9+(12) = \boxed{3}$

(c)　$13-(-5)$
　　$13+(5) = \boxed{18}$

Subtraction Rule
Subtracting b from a is defined as adding the opposite of b to a.
$a-b=a+(-b)$

Example 2. Evaluate a Variable Expression
Evaluate each expression when $x = 8.8$ and $y = -1.4$.

(a)　$x-y+2.3$
$(8.8)-(-1.4)+2.3$
$\boxed{12.5}$

(b)　$1.4+y-x$
$1.4+(-1.4)-(8.8)$
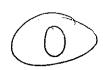$\boxed{-8.8}$

(c)　$x+5.1-y$
$(8.8)+5.1-(-1.4)$
$\boxed{15.3}$

Try It!
Evaluate the expression when $x = -3$ and $y = 5$. Show the analysis that leads to your answer.
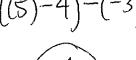
(a)　$x-y+8$
$(-3)-(5)+8$
$\boxed{0}$

(b)　$y-(x-2)$
$(5)-((-3)-2)$
$\boxed{10}$

(c)　$(y-4)-x$
$((5)-4)-(-3)$
$\boxed{4}$

Example 3. Using Subtraction to Evaluate Change

The temperature one morning was 15°C. By midday, the temperature was -5°C. What was the change in temperature?

$$-5°C - 15°C = -20°C$$

The change in temperature was a decrease of 20°C

What were the morning and midday temperatures in °F? (Use the formula $F = \frac{9}{5}C + 32$)

MORNING
$$F = \frac{9}{5}(15) + 32$$
$$F = 27 + 32 = 59°$$

MIDDAY
$$F = \frac{9}{5}(-5) + 32$$
$$F = -9 + 32 = 23°$$

MORNING = 59°F
MIDDAY = 23°F

What was the change in temperature in °F?

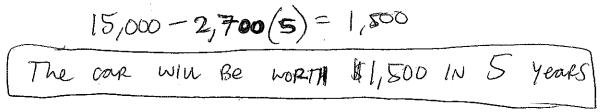$$23 - 59 = -36$$

The change in temperature was a decrease of 36°F.

Try It!

A new car is valued at $15,000. One year later, the care is valued at $12,300.

(a) What is the change in value of the car?

$$12,300 - 15,000 = -2700$$

The value of the car decreased by -$2700.

(b) Assume the car continues to lose value the same way, year after year. Write an expression that will give the value of the car after t years.

$$15,000 - 2,700t$$

(c) Use your expression to predict the value of the car after 5 years.

$$15,000 - 2,700(5) = 1,500$$

The car will be worth $1,500 in 5 years

Assignment: Page 82-83 (4 – 44) even

Review:

Write the following numbers in increasing order.

1.   5.31, 5.04, −5.32, −6.2, 6.3, 5.3

2. $-6\frac{2}{5}, 6.42, \frac{33}{5}, -6.3, -\frac{33}{5}, 6.05$

Evaluate the expression.

3. $|3.76|$

4. $|-75|$

5. $14 - |-7|$

6. $-17 - (-14)$

7. $-32 - (-27) - 9$

8. $35 - 0 - (-19)$