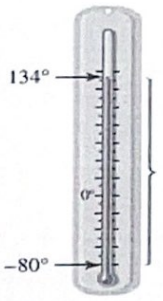
**EXAMPLE 10** Solving a Problem Involving Subtraction

The record-high temperature in the United States is 134°F, recorded at Death Valley, California, in 1913. The record low is −80°F, at Prospect Creek, Alaska, in 1971. See FIGURE 16. What is the difference between these highest and lowest temperatures? (*Source: National Climatic Data Center.*)

→ subtract

$134 - (-80)$

$134 + 80 = 214°$




$\begin{array}{r} {}^{1}134° \\ +\ 80° \\ \hline 214° \end{array}$

10b) Find the difference between a gain of 226 yards on the football field by the Chesterfield Bears and a loss of 7 yards by the New London Wildcats.

loss of 7 yards → −7

226

$226 - (-7)$

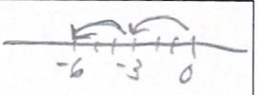
$= 226 + 7 = 233$ yards

## 1.6 Multiplying and Dividing Real Numbers

**Multiplying numbers with different signs**

Pos × Neg = Neg

Ex. 2(−3) means "2 groups of −3" = −6




**Multiplying two negative numbers**

Neg × Neg = Pos

**EXAMPLE 1** Multiplying a Positive Number and a Negative Number

Find each product, using the multiplication rule given in the box.

**(a)** $8(-5)$ $= -40$

**(b)** $(-5)4$ $= -20$

**(c)** $-9\left(\frac{1}{3}\right) = \frac{-9}{1} \cdot \frac{1}{3} = \frac{-9}{3} = -3$

**EXAMPLE 2** Multiplying Two Negative Numbers

**(a)** $-9(-2)$ $= 18$

**(b)** $-6(-12)$ $= 72$

**(c)** $-8(-1)$ $= 8$

different signs: Neg / Pos = Neg

Same sign: Neg / Neg = Pos

**EXAMPLE 4** Dividing Signed Numbers

Find each quotient.

(a) $\frac{8}{-2} = -4$

(b) $\frac{-100}{5} = -20$

(c) $\frac{-1.47}{-7} = 0.21$

$7\overline{)1.47}$ → $21$, $-14$, $07$

c) $-\frac{1}{8} \div \left(-\frac{3}{4}\right)$ KCF!

$-\frac{1}{8} \cdot \frac{-4}{3} = \frac{4}{24} = \frac{1}{6}$

d) $\frac{0}{14.2} = 0$

e) $\frac{14.2}{0}$ = Undefined

**EXAMPLE 5** Using the Rules for Order of Operations

Perform each indicated operation.

a) $-9(2) - (-3)(2)$

P E MD AS

$= -18 - -6$

$= -18 + 6$

$= -12$

b) $-5(-2-3)$

P E MD AS

$-5(-5)$

$= 25$

c) $-6 + 2(3-5)$

3+-5

P E MD AS

$-6 + 2(-2)$

$-6 + -4$

$= -10$

d) $\frac{5(-2)-3(4)}{2(1-6)} = \frac{-10-12}{2(-5)} = \frac{-10+-12}{-10} = \frac{-22}{-10}$

$= \frac{22 \div 2}{10 \div 2} = \frac{11}{5}$

e) $-4(6) - (-5)(12)$

$= -24 - -60$

$= -24 + 60$

$= 36$

**EXAMPLE 6** Evaluating Expressions for Numerical Values

Evaluate each expression for $x = -1$, $y = -2$, and $m = -3$.

a) $(3x + 4y)(-2m)$

P E MD AS

$(3 \cdot -1 + 4 \cdot -2)(-2 \cdot -3)$

$(-3 + -8)(6)$

$(-11)(6) = -66$

b) $2x^2 - 3y^2$

$(-1)^2 = -1 \cdot -1 = 1$

$(-2)^2 = -2 \cdot -2 = 4$

P E MD AS

$2(-1)^2 - 3(-2)^2$

$2 \cdot 1 - 3 \cdot 4$

$2 - 12$

$= -10$

c) $\frac{4y^2+x}{m} = \frac{4(-2)^2+(-1)}{-3}$

$= \frac{4 \cdot 4 + -1}{-3}$

$= \frac{16 + -1}{-3}$

$= \frac{15}{-3} = -5$