

# Evaluating Expressions

## Substitution Property

If  $a = b$ , then  $a$  may be replaced by  $b$  in any expression.

### Example 1

Evaluate  $5a + 4b$  if  $a = -2$  and  $b = 3$ .

Replace  $a$  with  $-2$  and  $b$  with  $3$ .

$$\begin{aligned}5a + 4b &= 5(-2) + 4(3) \\ &= -10 + 12 \\ &= 2\end{aligned}$$

### Example 2

Evaluate the following expressions if  $a = -4$ ,  $b = 2$ ,  $c = -5$ , and  $d = 6$ .

(a)  $7a - 4c = 7(-4) - 4(-5)$

This becomes  $-(-20)$ , or  $+20$ .

$$\begin{aligned}&= -28 + 20 \\ &= -8\end{aligned}$$

(b)  $7c^2 = 7(-5)^2 = 7 \cdot 25$

Evaluate the power first, then multiply by 7.

$$\begin{aligned}&= 175\end{aligned}$$

(c)  $b^2 - 4ac = 2^2 - 4(-4)(-5)$

$$\begin{aligned}&= 4 - 4(-4)(-5) \\ &= 4 - 80 \\ &= -76\end{aligned}$$

(d)  $b(a + d) = 2(-4 + 6)$

Add inside the parentheses first.

$$\begin{aligned}&= 2(2) \\ &= 4\end{aligned}$$