



**Objective 4.4** To multiply a monomial or binomial by a binomial

*Key*

4

Reminder: The product of two algebraic expressions is found by multiplying each term in one by each term in the other and then collecting like terms.

1. Simplify the following algebraic expressions.

a)  $5(4b^2 + 3b) = 20b^2 + 15b$

b)  $7(6b^2 + 5) = 42b^2 + 35$

c)  $3(8a^2 + 5a) = 24a^2 + 15a$

d)  $9(7m^2 + 8) = 63m^2 + 72$

2. Multiply.

a)  $(x + 4)(x + 5) = x^2 + 9x + 20$

b)  $(a + 3)(a + 11) = a^2 + 14a + 33$

c)  $(a + 2)(a + 7) = a^2 + 9a + 14$

d)  $(p + 1)(p + 8) = p^2 + 9p + 8$

3. Simplify the following algebraic expressions.

a)  $a(a + 3) = a^2 + 3a$

b)  $r(2 + r) = 2r + r^2$

c)  $p(p^2 + 4p) = p^3 + 4p^2$

d)  $y(y^2 + 8) = y^3 + 8y$

4. Find the monomial result of the following products.

a)  $3y \cdot 4y^2 = 12y^3$

b)  $7z^2 \cdot 3z^3 = 21z^5$

c)  $8ab \cdot 2a = 16a^2b$

d)  $5a \cdot 6b = 30ab$

5. Multiply these binomials.

a)  $(3x + 4)(2x - 5) = 6x^2 - 7x - 20$

b)  $(x - 6)(4x + 1) = 4x^2 - 23x - 6$

c)  $(5x + 1)(3x - 7) = 15x^2 - 32x - 7$

d)  $(8x - 5)(x + 2) = 8x^2 + 11x - 10$

6. Multiply.

a)  $2a(5a - 1) = 10a^2 - 2a$

b)  $-3(8a - 1) = -24a + 3$

c)  $4b(2 - a) = 8b - 4ab$

d)  $-5m(m - 4) = -5m^2 + 20m$

7. Simplify these algebraic expressions.

a)  $(-a + 2)(3a - 1) = -3a^2 + 7a - 2$

b)  $(-2b + 3)(-b - 1) = 2b^2 - b - 3$

c)  $(3z - 1)(-2z + 5) = -6z^2 + 17z - 5$

d)  $(4h + 3)(4h - 3) = 16h^2 - 9$

8. Complete the multiplication table.

$\cdot$	$(m+4)$	$(m-5)$	$(2m-1)$	$(3m+1)$	$(-m+7)$
2	$2m+8$	$2m-10$	$4m-2$	$6m+2$	$-2m+14$
$m$	$m^2+4m$	$m^2-5m$	$2m^2-m$	$3m^2+m$	$-m^2+7m$
$4m$	$4m^2+16m$	$4m^2-20m$	$8m^2-4m$	$12m^2+4m$	$-4m^2+28m$

9. Simplify the following expressions.

a)  $2(s+4) + 3s = 5s + 8$

b)  $7(m-5) + 8(m+1) = 15m - 27$

c)  $2a(2a-1) + 5a(a-7) = 9a^2 - 35a$

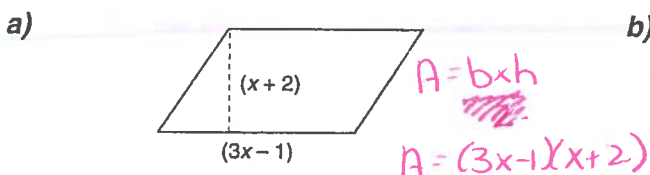
d)  $7b(3a+8) - 6a(2b-5) = 30a + 9ab + 56b$

10. Simplify each expression.

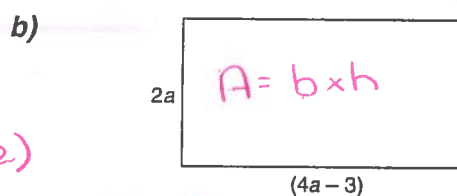
a)  $(3x-4)(x+7) + 3x = 3x^2 + 20x - 28$

b)  $8x^2 + 3x + (x-5)(3x+1) = 11x^2 - 11x - 5$

11. Give the algebraic expression for the area of each polygon.

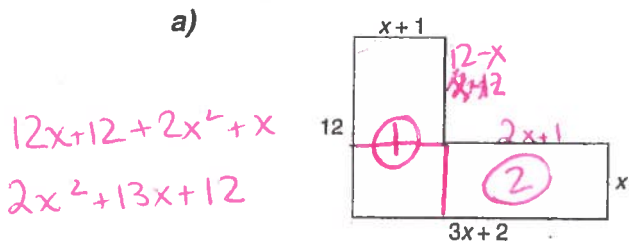


$A = 3x^2 + 5x - 2$



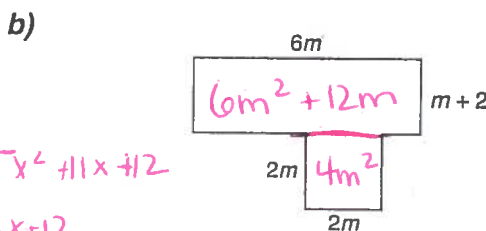
$A = 8a^2 - 6a$

12. Find the algebraic expression for the total area of each figure.



$12x + 12 + 2x^2 + x$   
 $2x^2 + 13x + 12$

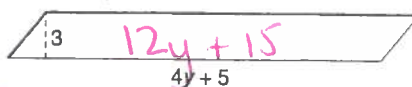
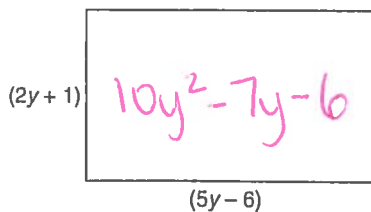
$2x^2 + 13x + 12$



$3x^2 + 2x + x^2 + 11x + 12$   
 $2x^2 + 13x + 12$

$10m^2 + 12m$

13. What is the sum of the areas of the two figures?



$10y^2 + 5y + 9$