**Module 11** Writing and Simplifying Algebraic Expressions
**Lesson 4** Multiplying Monomials and Binomials

## *Guided Notes Questions:*

1. Simplify: $x^3y \cdot 6xy^2$
   Select the correct answer.

   A. $6x^4y^3$
   B. $6x^3xyy^2$
   C. $6x^2y$
   D. $6x^3y^2$

| | **Answer Choice** |
|---|---|
| **A** | $6x^4y^3$ |
| Feedback | Correct. |
| **B** | $6x^3xyy^2$ |
| Feedback | This expression is not in simplest form. Group the like factors together. Remember, when multiplying powers with like bases, add the exponents. |
| **C** | $6x^2y$ |
| Feedback | Remember, when multiplying powers with like bases, add the exponents. |
| **D** | $6x^3y^2$ |
| Feedback | Remember, when multiplying powers with like bases, add the exponents. |

2. Simplify: $2x(x+2)$

Select the correct answer.

A. $2x^2+2$
B. $2x \bullet x+4x$
C. $2x^2+4x$
D. $x+4x$

| | **Answer Choice** |
|---|---|
| **A** | $2x^2+2$ |
| Feedback | Remember to distribute $2x$ to each term inside the parentheses. |
| **B** | $2x \bullet x+4x$ |
| Feedback | This expression is not in simplest form. Group the like factors together. Remember, when multiplying powers with like bases, add the exponents. |
| **C** | $2x^2+4x$ |
| Feedback | Correct. |
| **D** | $x+4x$ |
| Feedback | Remember to distribute $2x$ to each term inside the parentheses. |

3. Multiply: $-4ab\left(8a-3b^3\right)$

Select the correct answer.

A. $-32a^2b-12ab^4$

B. $-32aba+12b^4$

C. $-32a^2b-3b^3$

D. $-32a^2b+12ab^4$

| | **Answer Choice** |
|---|---|
| **A** | $-32a^2b-12ab^4$ |
| Feedback | Remember, the product of two factors with negative coefficients is positive. |
| **B** | $-32aba+12b^4$ |
| Feedback | This expression is not in simplest form. Group the like factors together. Remember, when multiplying powers with like bases, add the exponents. |
| **C** | $-32a^2b-3b^3$ |
| Feedback | Remember to distribute $-4ab$ to each term inside the parentheses. |
| **D** | $-32a^2b+12ab^4$ |
| Feedback | Correct. |

4. Simplify: $(2p-5)(p-4)$

Select the correct answer.

A. $2p^2+20$

B. $2p^2-8p-5p+20$

C. $2p^2-13p+20$

D. $2p-5p+20$

| | **Answer Choice** |
|---|---|
| **A** | $2p^2+20$ |
| Feedback | Remember, when multiplying two binomials; multiply the first, outer, inner, and last terms. |
| **B** | $2p^2-8p-5p+20$ |
| Feedback | This expression is not in simplest form. Group the like factors together. |
| **C** | $2p^2-13p+20$ |
| Feedback | Correct. |
| **D** | $2p-5p+20$ |
| Feedback | Remember, when multiplying two binomials; multiply the first, outer, inner, and last terms. |

**Module 11** Writing and Simplifying Algebraic Expressions
**Lesson 4** Multiplying Monomials and Binomials

## *Guided Practice:*

## *Set 1:*

1. Simplify: $\left(3v^4\right)\left(-5v^2\right)$
   Select the correct answer.

   A. $-15v^4v^2$
   B. $-15v^8$
   C. $-15v^6$
   D. $-15v^2$

| | **Answer Choice** |
|---|---|
| **A** | $-15v^4v^2$ |
| Feedback | This expression is not in simplest form. Group the like factors together. Remember, when multiplying powers with like bases, add the exponents. |
| **B** | $-15v^8$ |
| Feedback | Remember, when multiplying powers with like bases, add the exponents. |
| **C** | $-15v^6$ |
| Feedback | Correct. |
| **D** | $-15v^2$ |
| Feedback | Remember, when multiplying powers with like bases, add the exponents. |

2. Simplify $\left(-2x^2y^5\right)\left(-4x^3\right)$

Select the correct answer.

A. $8x^5y^5$
B. $-8x^5y^5$
C. $-6x^5y^5$
D. $8x^2x^3y^5$

| | **Answer Choice** |
|---|---|
| **A** | $8x^5y^5$ |
| Feedback | Correct. |
| **B** | $-8x^5y^5$ |
| Feedback | Remember, the product of two negative numerical factors is positive. |
| **C** | $-6x^5y^5$ |
| Feedback | Remember, when multiplying monomials, multiply the numerical factors. |
| **D** | $8x^2x^3y^5$ |
| Feedback | This expression is not in simplest form. Group the like factors together. Remember, when multiplying powers with like bases, add the exponents. |

3. Simplify: $(2r^3)(-3r^2s^2)(2s^2)$

Select the correct answer.

A. $-12(r^3)(r^2s^2)(s^2)$

B. $-12r^5s^4$

C. $r^5s^4$

D. $12r^5s^4$

| | **Answer Choice** |
|---|---|
| **A** | $-12(r^3)(r^2s^2)(s^2)$ |
| Feedback | This expression is not in simplest form. Group the like factors together. Remember, when multiplying powers with like bases, add the exponents. |
| **B** | $-12r^5s^4$ |
| Feedback | Correct. |
| **C** | $r^5s^4$ |
| Feedback | Remember, when multiplying monomials, multiply the numerical factors. |
| **D** | $12r^5s^4$ |
| Feedback | Remember, the product of two positive numerical factors and one negative numerical factor is negative. |

## *Set 2:*

1. Simplify: $5d(3d^2 - 6d)$
   Select the correct answer.

   A. $15d^3 - 6d$
   B. $15ddd^2 - 30ddd$
   C. $15d^3 + 30d^2$
   D. $15d^3 - 30d^2$

| | **Answer Choice** |
|---|---|
| **A** | $15d^3 - 6d$ |
| Feedback | Remember to distribute $5d$ to each term inside the parentheses. |
| **B** | $15ddd^2 - 30ddd$ |
| Feedback | This expression is not in simplest form. Group the like factors together. Remember, when multiplying powers with like bases, add the exponents. |
| **C** | $15d^3 + 30d^2$ |
| Feedback | Remember, the product of one positive numerical factor and one negative numerical factor is negative. |
| **D** | $15d^3 - 30d^2$ |
| Feedback | Correct. |

2. Simplify: $bc^3(9c^3 - 4b^2)$
Select the correct answer.

A. $9bc^6 - 4b^3c^3$
B. $9bc^6 - 4b^2$
C. $bc^3 \cdot 9c^3 - bc^3 \cdot 4b^2$
D. $9c^3 - 4b^3c^3$

| | **Answer Choice** |
|---|---|
| **A** | $9bc^6 - 4b^3c^3$ |
| Feedback | Correct. |
| **B** | $9bc^6 - 4b^2$ |
| Feedback | Remember to distribute $bc^3$ to each term inside the parentheses. |
| **C** | $bc^3 \cdot 9c^3 - bc^3 \cdot 4b^2$ |
| Feedback | This expression is not in simplest form. Group the like factors together. Remember, when multiplying powers with like bases, add the exponents. |
| **D** | $9c^3 - 4b^3c^3$ |
| Feedback | Remember to distribute $bc^3$ to each term inside the parentheses. |

## *Set 3:*

1. Simplify: $(m+2)(m+3)$
   Select the correct answer.

   A. $m^2+3m+2m+6$
   B. $m^2+5m+6$
   C. $m+2m+6$
   D. $m^2+6$

| | **Answer Choice** |
|---|---|
| **A** | $m^2+3m+2m+6$ |
| Feedback | This expression is not in simplest form. Group the like factors together. |
| **B** | $m^2+5m+6$ |
| Feedback | Correct. |
| **C** | $m+2m+6$ |
| Feedback | Remember, when multiplying two binomials; multiply the first, outer, inner, and last terms. |
| **D** | $m^2+6$ |
| Feedback | Remember, when multiplying two binomials; multiply the first, outer, inner, and last terms. |

2. Simplify: $(2r-7)(3r+5)$
   Select the correct answer.

   A. $6r^2-11r+35$
   B. $5r^2-11r-35$
   C. $2r-21r-35$
   D. $6r^2-11r-35$

| | **Answer Choice** |
|---|---|
| **A** | $6r^2-11r+35$ |
| Feedback | Remember, the product of one positive numerical factor and one negative numerical factor is negative. |
| **B** | $5r^2-11r-35$ |
| Feedback | Remember, when multiplying monomials, multiply the numerical factors. |
| **C** | $2r-21r-35$ |
| Feedback | Remember, when multiplying two binomials; multiply the first, outer, inner, and last terms. |
| **D** | $6r^2-11r-35$ |
| Feedback | Correct. |

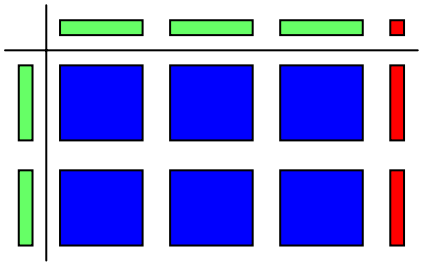
3. Simplify: $(p-8)(p+8)$
   Select the correct answer.

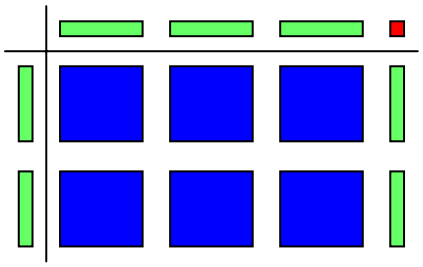
   A. $p^2 - 64$
   B. $p^2 + 8p - 8p - 64$
   C. $p^2$
   D. $p^2 + 64$

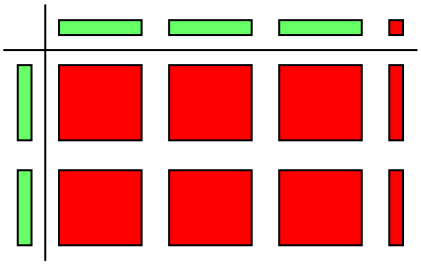
| | **Answer Choice** |
|---|---|
| **A** | $p^2 - 64$ |
| Feedback | Correct. |
| **B** | $p^2 + 8p - 8p - 64$ |
| Feedback | This expression is not in simplest form. Group the like factors together. |
| **C** | $p^2$ |
| Feedback | Remember, when multiplying two binomials; multiply the first, outer, inner, and last terms. |
| **D** | $p^2 + 64$ |
| Feedback | Remember, the product of one positive numerical factor and one negative numerical factor is negative. |

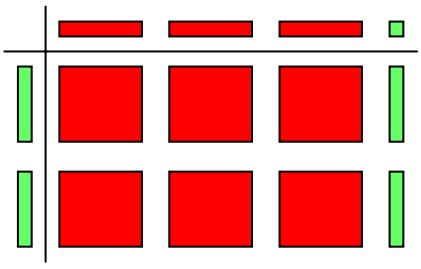
## *Manipulatives:*

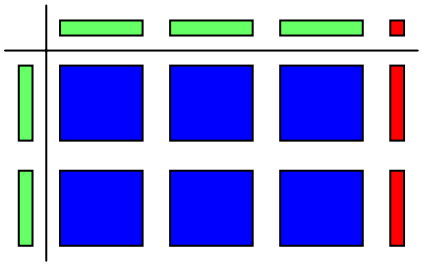
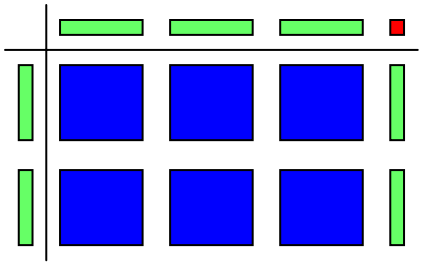
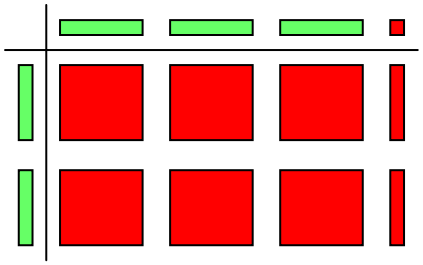
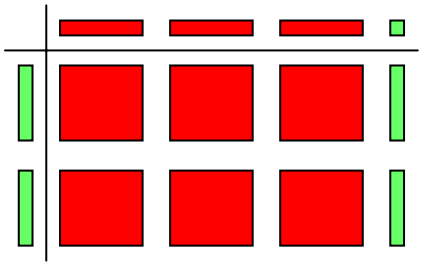
1. Simplify: $2k(3k-1)$
   Select the correct answer.

A.  $= 6k^2 - 2k$

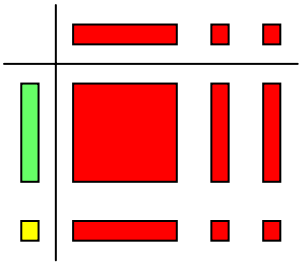
B.  $= 6k^2 + 2k$

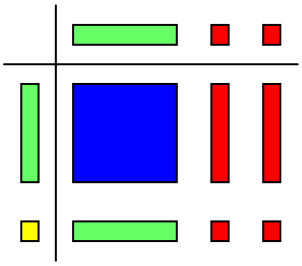
C.  $= -6k^2 - 2k$

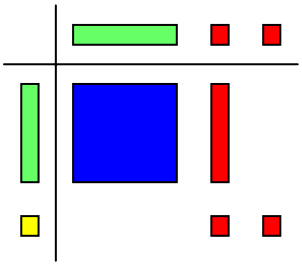
D.  $= -6k^2 + 2k$

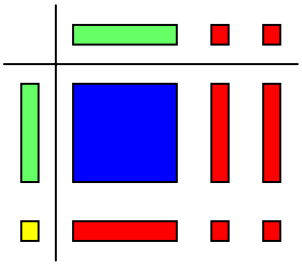
| | Answer Choice |
|---|---|
| **A** |  $= 6k^2 - 2k$ |
| Feedback | Correct. |
| **B** |  $= 6k^2 + 2k$ |
| Feedback | Remember, the product of one green rectangular tile ($k$) and one red small square tile (–1) is a red rectangular tile ($–k$). |
| **C** |  $= -6k^2 - 2k$ |
| Feedback | Remember, the product of two green rectangular tiles ($k$) is one blue large square tile ($k^2$). |
| **D** |  $= -6k^2 + 2k$ |
| Feedback | The width of the rectangle is incorrect. Remember to use a green rectangular tile for $k$ and a red small square tile for –1. |

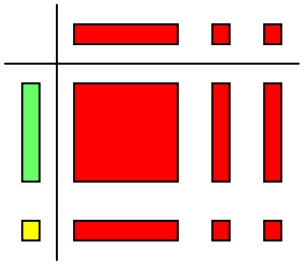
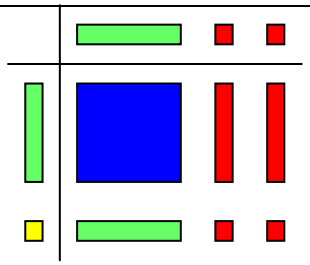
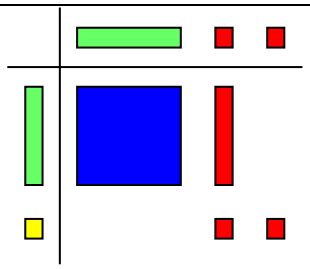
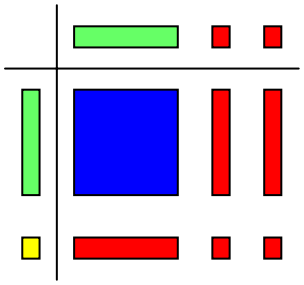
2. Simplify: $(f+1)(f-2)$.
Select the correct answer.

A.  $= -f^2 - 3f - 2$

B.  $= f^2 - 2f + f - 2$

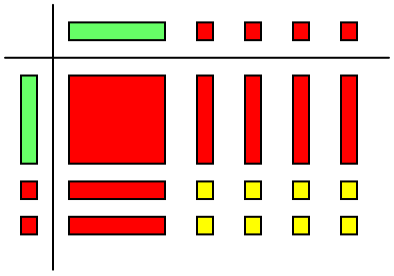
C.  $= f^2 - f - 2$

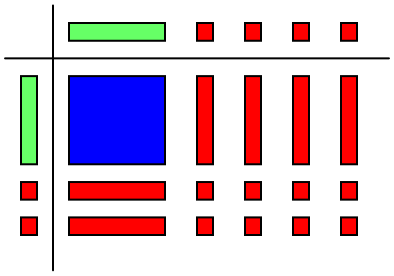
D.  $= f^2 - 3f - 2$

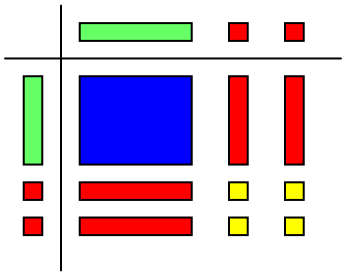
| | Answer Choice |
|---|---|
| **A** |  $= -f^2 - 3f - 2$ |
| Feedback | The width of the rectangle is incorrect. Remember to use a green rectangular tile for *f* and a red small square tiles for – 1. |
| **B** |  $= f^2 - 2f + f - 2$ |
| Feedback | Remember, one red rectangle tile (–*f*) and one green rectangle tile (*f*) make a zero pair. |
| **C** |  $= f^2 - f - 2$ |
| Feedback | Correct. |
| **D** |  $= f^2 - 3f - 2$ |
| Feedback | Remember, the product of one yellow small square tile (1) and one green rectangular tile (*f*) is one green rectangular tile (*f*). |

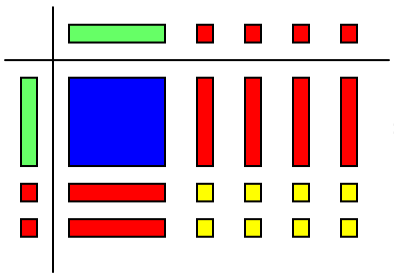
3. Simplify: $(x-2)(x-4)$

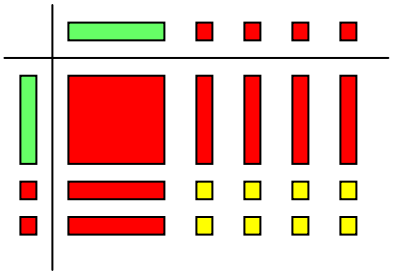
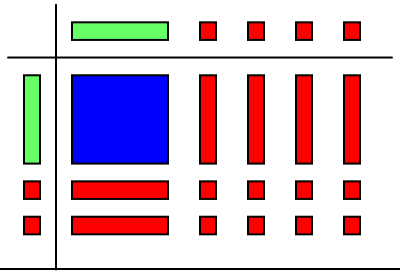
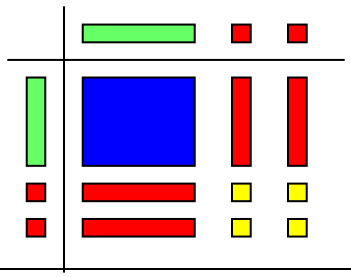
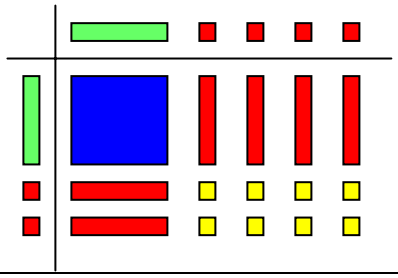
Select the correct answer.

A.  $= -x^2 - 6x + 8$

B.  $= x^2 - 6x - 8$

C.  $= x^2 - 4x + 4$

D.  $= x^2 - 6x + 8$

| | Answer Choice |
|---|---|
| **A** |  $= -x^2 - 6x + 8$ |
| Feedback | Remember, the product of two green rectangular tiles ($x$) is one blue large square tile ($x^2$). |
| **B** |  $= x^2 - 6x - 8$ |
| Feedback | Remember, the product of two small red square tiles (–1) is one small yellow square tile (1). |
| **C** |  $= x^2 - 4x + 4$ |
| Feedback | The width of the rectangle is incorrect. Remember to use a green rectangular tile for $x$ and a red small square tiles for –1. |
| **D** |  $= x^2 - 6x + 8$ |
| Feedback | Correct. |