RAISE For Success + Equity
Rice Algebra Initiative

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# Unit 6 Student Diagnostic Answer Key

These materials, when encountered before the denoted lesson, support access to the lesson and identify potential areas where additional support may be required. Note that the content in these lesson diagnostics represents prerequisite skills and does not address the required rigor for full mastery of the on-grade level standards.

Your students may benefit from using these materials in conjunction with the Unit Overview and Readiness page (quiz and mini-lessons).

## Lesson 6.1: Add and Subtract Polynomials Check-in Answers

| Q# | Standard |
|---|---|
| 1 | MATH.6.7(B) Distinguish between expressions and equations verbally, numerically, and algebraically. |

Examine the following 4 items. Determine which one doesn't belong and then circle it.

$$-3 \qquad 3x \qquad -3x^2 \qquad -5x$$

Explain why the item you circled does not belong in a group with the other items.

**Answers:** Answers will vary, but here are some samples.

- I picked -3 because all the other items have variables and it doesn't.
- I picked $3x$ because it is positive and all the other items are negative.
- I picked $-3x^2$ because it is the only one that has an exponent of two.
- I picked $-5x$ because it is the only one that has a coefficient of five. All the others have a 3.

## Lesson 6.2: Multiplying Polynomials Check-in Answers

| Q# | Standard |
|---|---|
| 1-6 | MATH.6.7(D) Generate equivalent expressions using the properties of operations: inverse, identity, commutative, associative,and distributive properties. |

Simplify the following expressions.

1. $2(x + 3)$

**Answer:** $2x + 6$

2. $-5(2 - 3a)$

**Answer:** $-10 + 15a$

3. $-(x - 4)$

**Answer:** $-x + 4$

4. $8 - 2(x + 3)$

**Answer:** $2 - 2x$ or $-2x + 2$

5. $7x + 5x(x + 4)$

**Answer:** $5x^2 + 27x$

6. $8(x - 1) - (x + 5)$

**Answer:** $7x - 13$

## Lesson 6.3: Dividing Polynomials Check-in Answers

| Q# | Standard |
|---|---|
| 1-3 | MATH.6.7(A) Generate equivalent numerical expressions using order of operations, including whole number exponents and prime factorization. |
| 4-5 | MATH.5.3(C) Solve with proficiency for quotients of up to a four-digit dividend by a two-digit divisor using strategies and the standard algorithm. |

Simplify each expression.

1. $\frac{30xy^3}{5xy}$

**Answer:** $6y^2$

2. $\frac{3x + x^2}{x}$

**Answer:** $3 + x$

3. $\frac{-72a^7b^3}{8a^2b^2}$

**Answer:** $-9a^5b$

Complete the division for each numeric expression.

4. $192 \div 6$

**Answer:** 32

5. $315 \div 7$

**Answer:** 45

## Lesson 6.4: Greatest Common Factor and Factor by Grouping Check-in Answers

| Q# | Standard |
|---|---|
| 1-4 | MATH.6.7(A) Generate equivalent numerical expressions using order of operations, including whole number exponents and prime factorization. |

For each of the expressions given, determine if the quantity is a common factor. Then, determine if it is the greatest common factor.

**Answers:**

| | Yes, it is a factor | Yes, it is the GCF |
|---|---|---|
| Is $3x$ a factor of $21x^3 + 9x^2 - 15x$? Is it the greatest common factor? | ☑ | ☑ |
| Is 5 a factor of $25m^4 - 35m^3 + 20m^2$? Is it the greatest common factor? | ☑ | ☐ |
| Is $7x^3$ a factor of $14x^3 - 70x^2 - 105x$? Is it the greatest common factor? | ☐ | ☐ |
| Is $4mn$ a factor of $8m^3 - 12m^2n + 20mn^2$? Is it the greatest common factor? | ☐ | ☐ |

## Lesson 6.5: Factor Trinomials Check-in Answers

| Q# | Standard |
|---|---|
| 1-6 | MATH.6.7(A) Generate equivalent numerical expressions using order of operations, including whole number exponents and prime factorization. |
| 7-8 | ALG.10(D) Rewrite polynomial expressions of degree one and degree two in equivalent forms using the distributive property. |

1. Find all of the factor pairs of 72.

**Answer:** 1 & 72; 2 & 36; 3 & 24; 4 & 18; 6 & 12; 8 & 9

2. Find all of the factor pairs of 24.

**Answer:** 1 & 24; 2 & 12; 3 & 8; 4 & 6

3. What is the product of $-9(6)$?

**Answer:** -54

4. What is the sum of $-9+6$?

**Answer:** -3

5. What is the product of $9(-6)$?

**Answer:** -54

6. What is the sum of $9+-6$?

**Answer:** 3

7. Find the product of $(x + 8)(x + 9)$.

**Answer:** $x^2 + 17x + 72$

8. Find the product of $(x + 4)(x - 6)$

**Answer:** $x^2 - 2x - 24$

## Lesson 6.6: Factor Special Products Check-in Answers

| Q# | Standard |
|---|---|
| 1 | MATH.6.7(A) Generate equivalent numerical expressions using order of operations, including whole number exponents and prime factorization. |
| 2-3 | ALG.10(D) Rewrite polynomial expressions of degree one and degree two in equivalent forms using the distributive property |

1. Simplify $(3x^3)^2$

**Answer:** $9x^6$

2. Multiply $(x + 3)^2$

**Answer:** $x^2 + 6x + 9$

3. Multiply $(x - 3)(x + 3)$

**Answer:** $x^2 - 9$

## Lesson 6.7: General Strategy for Factoring Polynomials Check-in Answers

| Q# | Standard |
|---|---|
| 1-6 | ALG.10(E) Factor, if possible, trinomials with real factors in the form ax2 + bx + c, including perfect square trinomials of degree two.<br>ALG.10(F) Decide if a binomial can be written as the difference of two squares and, if possible, use the structure of a difference of two squares to rewrite the binomial. |

Identify each type of polynomial by selecting the appropriate box.

**Answers:**

| Polynomial | It is a difference of two squares | It is a sum of two squares | It is perfect square trinomial | It can be factored, but it is not "special" |
|---|---|---|---|---|
| $x^2 - 4$ | ☑ | ☐ | ☐ | ☐ |
| $x^2 + 5x + 6$ | ☐ | ☐ | ☐ | ☑ |
| $81x^2 - 9$ | ☑ | ☐ | ☐ | ☐ |
| $x^2 + 1$ | ☐ | ☑ | ☐ | ☐ |
| $x^2 - 10x + 25$ | ☐ | ☐ | ☑ | ☐ |
| $16x^2 + 8x + 1$ | ☐ | ☐ | ☑ | ☐ |