Simplify Rational Expressions Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. (1 point) For which set of values of $x$ is the algebraic expression \( \frac{x^2 - 16}{x^2 - 4x - 12} \) undefined?
   a. \{-6, 2\}
   b. \{-4, 3\}
   c. \{-4, 4\}
   d. \{-2, 6\}

2. (1 point) Simplify the rational expression \( \frac{x - 3}{x^2 - 5x + 6} \).
   a. \( \frac{3}{x - 5} \)
   b. \( \frac{1}{x - 2} \)
   c. \( x - 2 \)
   d. \( \frac{x}{x - 2} \)

3. (1 point) Which expression represents \( \frac{25x - 125}{x^2 - 25} \) in simplest form?
   a. \( \frac{5}{x} \)
   b. \( \frac{-5}{x} \)
   c. \( \frac{25}{x - 5} \)
   d. \( \frac{25}{x + 5} \)

4. (1 point) Which expression represents \( \frac{x^2 - 2x - 15}{x^2 + 3x} \) in simplest form?
   a. \( -5 \)
   b. \( \frac{x - 5}{x} \)
   c. \( \frac{-2x - 5}{x} \)
   d. \( \frac{-2x - 15}{3x} \)
BONUS

5. (3 points) What is simplest form?

\[
\frac{(x + 3)(x^2 - 1)}{(x + 1)(3x - 3)}
\]

Answer: ________________________________
Simplify Rational Expressions Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: D
   \[ x^2 - 4x - 12 = 0 \]
   \[ (x - 6)(x + 2) = 0 \]
   \[ x = 6, x = -2 \]

   PTS: 1   REF: 061125ia   STA: A.A.15   TOP: Undefined Rationals

2. ANS: B
   \[ \frac{x - 3}{x^2 - 5x + 6} = \frac{x - 3}{(x - 3)(x - 2)} \]
   Factor the numerator and denominator.
   \[ = \frac{x - 3}{(x - 3)(x - 2)} \]
   Divide out the common factors.
   \[ = \frac{1}{x - 2} \]
   Simplify.

   PTS: 1   DIF: Basic   REF: Page 867
   OBJ: 12-3.3 Simplifying Rational Expressions with Trinomials
   NAT: 12.5.3.c   STA: A.A.16   TOP: 12-3 Simplifying Rational Expressions

SHORT ANSWER

5. ANS:
   \[ \frac{x + 3}{3} \]
   \[ \frac{x^2 - 1}{x + 1} \cdot \frac{x + 3}{3x - 3} = \frac{(x + 3)(x - 1)}{x + 1} \cdot \frac{x + 3}{3(x - 1)} = \frac{x + 3}{3} \]

   PTS: 3   REF: 060815ia   STA: A.A.18   TOP: Multiplication and Division of Rationals
Simplify Rational Expressions Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. (1 point) Which expression represents \( \frac{25x - 125}{x^2 - 25} \) in simplest form?
   a. \( \frac{25}{x + 5} \)
   b. \( \frac{25}{x - 5} \)
   c. \( \frac{-5}{x} \)
   d. \( \frac{5}{x} \)

2. (1 point) Simplify the rational expression \( \frac{x - 3}{x^2 - 5x + 6} \).
   a. \( x - 2 \)
   b. \( \frac{1}{x - 2} \)
   c. \( \frac{x}{x - 2} \)
   d. \( \frac{3}{x - 5} \)

3. (1 point) Which expression represents \( \frac{x^2 - 2x - 15}{x^2 + 3x} \) in simplest form?
   a. \( -5 \)
   b. \( \frac{-2x - 15}{3x} \)
   c. \( \frac{x - 5}{x} \)
   d. \( \frac{-2x - 5}{x} \)

4. (1 point) For which set of values of \( x \) is the algebraic expression \( \frac{x^2 - 16}{x^2 - 4x - 12} \) undefined?
   a. \( \{-4, 3\} \)
   b. \( \{-2, 6\} \)
   c. \( \{-4, 4\} \)
   d. \( \{-6, 2\} \)
BONUS

5. (3 points) What is \[ \frac{(x + 3)(x^2 - 1)}{(x + 1)(3x - 3)} \] simplest form?

Answer: ___________________________________________
Simplify Rational Expressions Quiz
Answer Section

MULTIPLE CHOICE

1. ANS: A PTS: 1 REF: 080821ia STA: A.A.16
   TOP: Rational Expressions

2. ANS: B
   \[ \frac{x - 3}{x^2 - 5x + 6} = \frac{x - 3}{(x - 3)(x - 2)} \]
   Factor the numerator and denominator.
   \[ = \frac{x - 3}{(x - 3)(x - 2)} \]
   Divide out the common factors.
   \[ = \frac{1}{x - 2} \]
   Simplify.

   Feedback
   A Factor the denominator. Divide out common factors.
   B Correct!
   C Factor the denominator. Divide out common factors.
   D Factor the denominator. Divide out common factors.

   PTS: 1 DIF: Basic REF: Page 867
   OBJ: 12-3.3 Simplifying Rational Expressions with Trinomials
   NAT: 12.5.3.c STA: A.A.16 TOP: 12-3 Simplifying Rational Expressions

3. ANS: C PTS: 1 REF: 060921ia STA: A.A.16
   TOP: Rational Expressions

4. ANS: B
   \[ x^2 - 4x - 12 = 0 \]
   \[ (x - 6)(x + 2) = 0 \]
   \[ x = 6 \quad x = -2 \]

   PTS: 1 REF: 061125ia STA: A.A.15 TOP: Undefined Rationals

SHORT ANSWER

5. ANS:
   \[ \frac{x + 3}{3} \]
   \[ \frac{x^2 - 1}{x + 1} \cdot \frac{x + 3}{3x - 3} = \frac{(x + 1)(x - 1)}{x + 1} \cdot \frac{x + 3}{3(x - 1)} = \frac{x + 3}{3} \]

   PTS: 3 REF: 060815ia STA: A.A.18 TOP: Multiplication and Division of Rationals
Simplify Rational Expressions Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. (1 point) Simplify the rational expression \( \frac{x - 3}{x^2 - 5x + 6} \).
   a. \( \frac{x}{x - 2} \)  
   b. \( \frac{3}{x - 5} \)  
   c. \( \frac{1}{x - 2} \)  
   d. \( x - 2 \)

____ 2. (1 point) Which expression represents \( \frac{25x - 125}{x^2 - 25} \) in simplest form?
   a. \( \frac{25}{x + 5} \)  
   b. \( \frac{5}{x} \)  
   c. \( \frac{25}{x - 5} \)  
   d. \( \frac{-5}{x} \)

____ 3. (1 point) For which set of values of \( x \) is the algebraic expression \( \frac{x^2 - 16}{x^2 - 4x - 12} \) undefined?
   a. \( \{-4, 3\} \)  
   b. \( \{-4, 4\} \)  
   c. \( \{-6, 2\} \)  
   d. \( \{-2, 6\} \)

____ 4. (1 point) Which expression represents \( \frac{x^2 - 2x - 15}{x^2 + 3x} \) in simplest form?
   a. \( -5 \)  
   b. \( \frac{x - 5}{x} \)  
   c. \( \frac{-2x - 15}{3x} \)  
   d. \( \frac{-2x - 5}{x} \)
BONUS

5. (3 points) What is simplest form? 

\[
\frac{(x + 3) \left( x^2 - 1 \right)}{(x + 1)(3x - 3)}
\]

Answer: ________________________________
MULTIPLE CHOICE

1. ANS: C
   \[
   \frac{x - 3}{x^2 - 5x + 6} = \frac{x - 3}{(x - 3)(x - 2)} \quad \text{Factor the numerator and denominator.}
   \]
   \[
   = \frac{x - 3}{(x - 3)(x - 2)} \quad \text{Divide out the common factors.}
   \]
   \[
   = \frac{1}{x - 2} \quad \text{Simplify.}
   \]

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<thead>
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PTS: 1  DIF: Basic  REF: Page 867  
OBJ: 12-3.3 Simplifying Rational Expressions with Trinomials  
NAT: 12.5.3.c  STA: A.A.16  TOP: 12-3 Simplifying Rational Expressions

2. ANS: A  PTS: 1  REF: 080821ia  STA: A.A.16  
TOP: Rational Expressions

3. ANS: D
   \[
   x^2 - 4x - 12 = 0
   \]
   \[
   (x - 6)(x + 2) = 0
   \]
   \[
   x = 6 \quad x = -2
   \]

PTS: 1  REF: 061125ia  STA: A.A.15  TOP: Undefined Rationals

4. ANS: B  PTS: 1  REF: 060921ia  STA: A.A.16  
TOP: Rational Expressions

SHORT ANSWER

5. ANS:
   \[
   \frac{x + 3}{3}
   \]
   \[
   \frac{x^2 - 1}{x + 1} \cdot \frac{x + 3}{3x - 3} = \frac{(x + 1)(x - 1)}{x + 1} \cdot \frac{x + 3}{3(x - 1)} = \frac{x + 3}{3}
   \]

PTS: 3  REF: 060815ia  STA: A.A.18  TOP: Multiplication and Division of Rationals

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