LESS TRANSPARENT

EXAMPLE M: SIMPLIFY EXPRESSIONS

Used by permission of Dr. Trina Palmer, Appalachian State University

Name: _____

Directions: Simplify each.

1. $$\frac{2w^2 - 50}{x^2 - 4w - 5}$$

2. $$\frac{-3w^2 - 9w + 54}{w^2 - 9w + 18}$$

3. $$\frac{16v^4w^2}{12w^2 + 20u^4w}$$

TILT Higher Ed
TRANSPARENCY IN LEARNING & TEACHING

MORE TRANSPARENT

Revised EXAMPLE M: SIMPLIFY EXPRESSIONS

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MAT 1531 Simplification Due: September 20

Purpose:

The purpose of this assignment is to (1) improve your mathematical writing and (2) demonstrate your algebraic manipulation skills. This assignment will help prepare you for simplifying expressions from calculus and help you communicate where your understanding and misunderstanding are. Knowing how to simplify expressions is like using correct grammar -- it makes the written mathematics easier to read and understand. Simplifying mathematical models can reduce possible errors. Real-life modeling problems are everywhere such as modeling the spread of COVID-19 or predicting future global temperatures.

Student Learning Outcomes addressed in this assignment:

1. Simplify Algebraic Expressions
2. Communicate algebraic reasoning
3. Practice modeling for real-world challenges

Assignment:

Simplify one of the following problems and include justifications for each manipulation.

1. $\dfrac{2w^2 - 50}{\text{x2} - 4\text{w} - 5}$ 2. $\dfrac{-3w^2 - 9w + 54}{w^2 - 9w + 18}$ 3. $\dfrac{16v^4w^2}{12w^2 + 20u^4w}$

Sample Problem:

Simplify: $\dfrac{u^2-7u+6}{5-5u^2}$	Answer: $-\dfrac{u-6}{5(1+u)}$
$\dfrac{u^2-7u+6}{5-5u^2}$	Restatement
$\dfrac{(u-6)(u-1)}{5(1-u^2)}$	Factor the numerator and denominator
$\dfrac{(u-6)(u-1)}{5(1+u)(1-u)}$	Factor the denominator (difference of two squares)
$\dfrac{(u-6)(u-1)}{-5(1+u)(u-1)}$	Factor out $-u$ in the denominator
$\dfrac{u-6}{-5(1+u)}$	Cancel the common factor $(u-1)$ in the numerator and denominator
$-\dfrac{u-6}{5(1+u)}$	Apply the fraction rule $\dfrac{a}{-b} = -\dfrac{a}{b}$

Criteria:

	Proficient	Emerging	Needs Improvement
Algebraic accuracy	Includes most steps and steps are accurate (5)	missing a few steps and/or some steps are inaccurate (3)	many missing steps and/or many inaccurate steps (1)
Mathematics language	reasoning is correct and mostly correct math language (5)	reasoning is mostly correct and mostly correct mathematics language (3)	Much of the reasoning and language is incorrect (1)