Mathematics Assessment Project
CLASSROOM CHALLENGES
Formative Assessment Lessons (beta) for High School

High School
Problem Solving
Devising a Measure for Correlation
Generalizing Patterns: Table Tiles
Geometry Problems: Circles and Triangles
Modeling: Having Kittens
Inscribing and Circumscribing Right Triangles
Interpreting Statistics: A Case of Muddying the Waters
Medical Testing
Modeling Conditional Probabilities 1: Lucky Dip
Modeling: Rolling Cups
Optimization Problems: Boomerangs
Proofs of the Pythagorean Theorem
Solving Geometry Problems: Floodlights
Solving Quadratic Equations: Cutting Corners

Concept Development
2D Representations of 3D Objects
Calculating Volumes of Compound Objects
Comparing Investments
Equations of Circles 1
Equations of Circles 2
Evaluating Statements About Enlargements (2D and 3D)
Evaluating Statements About Length and Area
Ferris Wheel
Finding Equations of Parallel and Perpendicular Lines
Forming Quadratics
Functions and Everyday Situations
Defining Regions Using Inequalities
Interpreting Algebraic Expressions
Manipulating Polynomials

Read more about the purpose of the MAP Classroom Challenges...

Sorting Equations and Identities
Mathematical goals

This lesson unit is intended to help you assess how well students are able to:

- Recognize the differences between equations and identities.
- Substitute numbers into algebraic statements in order to test their validity in special cases.
- Resist common errors when manipulating expressions such as \(2(x - 3) = 2x - 3\); \((x + 3)^2 = x^2 + 3^2\).
- Carry out correct algebraic manipulations.

It also aims to encourage discussion on some common misconceptions about algebra.

Introduction

The lesson unit is structured in the following way:

- Before the lesson, students work individually on an assessment task that is designed to reveal their current understandings and difficulties. You then review their work, and create questions for students to answer in order to improve their solutions.
- After a whole-class introduction, students work in small groups on a collaborative discussion task.
- Students return to their original task and try to improve their own responses.

Materials required

- Each student will need two copies of the assessment task \(\text{Equations and Identities}\), a mini-whiteboard, a pen, and an eraser.
- Each small group of students will need \(\text{Card Set: Always, Sometimes, or Never True}\) (cut into cards before the lesson), a marker pen, a glue stick, and a large sheet of paper for making a poster.
- There is a projector resource to support the whole-class introduction.

Time needed

Approximately ten minutes before the lesson for the assessment task, a one hour lesson, and ten minutes in a follow-up lesson (or for homework). Timings given are only approximate. Exact timings will depend on the needs of the class.
Mathematical Practices

This lesson involves a range of mathematical practices from the standards, with emphasis on:

MP3: Construct viable arguments and critique the reasoning of others
MP7: Look for and make use of structure

Mathematical Content

This lesson asks students to select and apply mathematical content from across the grades, including the content standards:

H.A-SSE: Write expressions in equivalent forms to solve problems
H.A-SSE: Interpret the structure of expressions
H.A-REI: Solve equations and inequalities in one variable

Resources

Lesson (complete)

l13_equations_identities_beta_complete.pdf (826.3K PDF/Acrobat 09 Feb 2011)

Projector Resources

l13_equations_identities_beta_slides.ppt (235.5K MS PowerPoint 09 Feb 2011)

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