

Mathematical Reasoning

Transitioning Students from ABE to GED[®] Level Skills

Facilitator

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Session Objectives



- Discuss Performance Level Descriptors (PLDs) at Levels 1 and 2
- Identify selected skill sets students need to successfully transition from ABE to GED[®] preparation
- Explore resources to aid students in developing mathematical reasoning skills

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Low Intermediate Basic	High Intermediate	Low Adult Secondary
Education	Basic Education	Education
(4-5.9 GLE)	(6-8.9 GLE)	(9-10.9 GLE)
Students can perform with high accuracy all four basic math operations using whole numbers up to three digits and can identify and use all basic mathematical symbols.	Students can perform all four basic math operations with whole numbers and fractions; can determine correct math operations for solving narrative math problems and can convert fractions to decimals and decimals to fractions; and can perform basic operations on fractions.	Students can perform all basic math functions with whole numbers, decimals, and fractions; can interpret and solve simple algebraic equations, tables, and graphs and can develop own tables and graphs; and can use math in business transactions.





















How Would You Teach It?

- Determine how you would teach this skill
 - Introduce this topic
 - Model your approach to a solution by making your thinking process visible
- Highlight two or three points from your script
- · Let's discuss

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Instructions: Order the original numbers provided below in ascending order using a number line.

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- 5/8
- 0.8314
- 1/16
- 0.4823
- 5/12

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	Rule	Example
1	$x^1 = x$	5 ¹ = 5
2	x ⁰ = 1	$5^0 = 1$
3	$x^{-1} = \frac{1}{x^1}$	$5^{-1} = \frac{1}{5}$
4	$(x^m)(x^n) = x^{m+n}$	$(x^2)(x^3) = x^{2+3} = x^5$
5	$\frac{x^m}{x^n} = x^{m-n}$	$\frac{x^3}{x^2} = x^{3-2} = x^1$
6	$(x^{m})^{n} = x^{(m)(n)}$	$(x^3)^2 = x^{(3)(2)} = x^6$
7	$(xy)^n = x^n y^n$	$(xy)^3 = x^3y^3$
8	$(\frac{x}{y})^n = \frac{x^n}{y^n}$	$(\frac{x}{y})^3 = \frac{x^3}{y^3}$
9	x ⁻ⁿ = <u>1</u>	$x^{-2} = \frac{1}{2}$



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Have students...

- Memorize the first 6 perfect cubes (1, 8, 27, ..., 216)
- Understand the following:
 - Inverse relationships between cubes and cube roots
 - Cubing a negative number versus the negative of a cubed number
 - Practice computing with cubes and cube roots that include fractions and decimals



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Sample Items		
 Ordering Fractions and Decimals 	Place the following numbers in order from greatest to least: 0.2, -1/2, 0.6, 1/3, 1, 0, 1/6	
 Factors and Multiples 	Find the LCM that is necessary to perform the indicated operation. $7/6 - 1/4 =$	
Rules of Exponents	Simplify the following: $(x^3)^5$	
• Distance on a Number Line	Find the distance between two points -9 and -3 on a number line.	
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First Read: Read for Understanding



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An apartment building contains 12 units consisting of one- and two-bedroom apartments that rent for \$360 and \$450 per month, respectively. When all units are rented, the total monthly rental is \$4,950. What is the number of two-bedroom apartments?



Second Read: Identify a Problem.Solving Process
 What is the pertinent information in this problem?
 What problem-solving strategies could I use?
 Which of those problem-solving strategies is best suited for this problem?
 How will I represent the problem in the symbolic language of mathematics?
 What mathematical details will I select as I reason and solve this problem?



Begin with the Basics

Noticing

- Allows all students to participate
- Work independently or in groups
- Focuses on what is stated in the problem
- Identifies what are the "givens" of the problem

Wondering

- Is the planning part
 - Talk about strategies to use
 - Restate the problem
 - Pose questions about what is noticed
 - Supports students slowing down and thinking
 - Prompts brainstorming, listing, and discussing ideas

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Resources – A Few to Get Started Building a Number Line https://unctv.pbslearningmedia.org/resource/mgbh.math.ns.numbline/building-anumber-line/#.WU1B-IWcHnM Answer the Why – Order of Operations https://www.khanacademy.org/math/pre-algebra/pre-algebra-arith-prop/prealgebra-order-of-operations/v/introduction-to-order-of-operations Rules of Exponents – The Math Dude http://www.montgomeryschoolsmd.org/departments/itv/MathDude/watchonline.aspx?id=22 Math is Fun – Properties of Zero http://www.mathsisfun.com/numbers/zero.html National Library of Virtual Manipulatives for Math http://nlvm.usu.edu/en/nav/index.html GED 44 GEDtestingservice.com · GED.com





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Thank you!

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