ipdae

INSTITUTE FOR THE PROFESSIONAL DEVELOPMENT OF ADULT EDUCATORS

CALCULATOR-PROHIBITED INDICATORS

Part 1

www.floridaipdae.org

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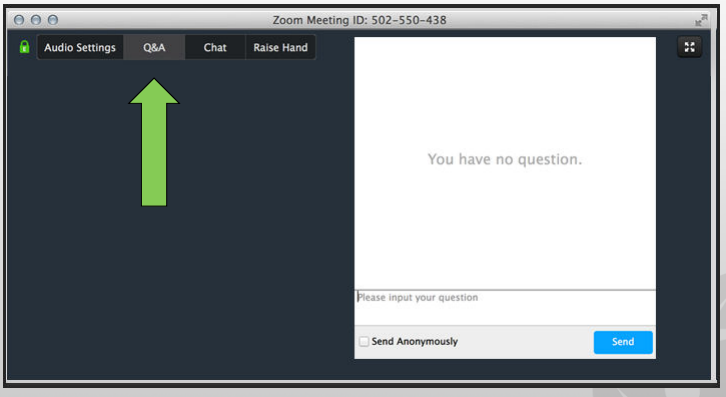
Agenda

I. Housekeeping Reminders
II. Objectives
III. Q1 Indicators (Q.1)
    - Ordering Fractions and Decimals
    - Factors and Multiples
    - Rules of Exponents
    - Distance on a Number Line
IV. The IPDAE Website
V. Summary
VI. Evaluation

Webinar Things to Remember

- If you have question, please type it into the **Q&A** option.



- Attendee microphones will be muted. You will be in **listen only** mode.
- Today's presentation is being **recorded** and it will be archived and available on the IPDAE website within 48 hours.

Objectives

At the end of this webinar, participants are expected to:

- Increase students' performance by incorporating the Test-Taker Recommendations for Calculator-Prohibited Indicators in daily classroom instruction.
- Review pertinent math concepts and skills tested on the non-calculator section of the GED Math Module through sample problems.
- Discuss best practices and explore resources that will help in developing lessons when covering GED's calculator-prohibited indicators.

Ordering Fractions and Decimals

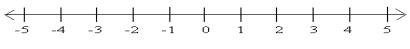
Q.1.a. Order fractions and decimals, including on a number line.

These questions may require:

• comparing or ordering positive numbers, or negative numbers, or both,

• with or without a number line.

Test takers generally do very well on this indicator, with the exception of questions that require test takers to compare or order a set consisting entirely of negative numbers.



Ordering Fractions and Decimals

Recommendations for Test-Takers:

- Leverage skills in comparing and ordering positive fractions and decimals toward similar skills comparing and ordering negative fractions and decimals.
- Understand the difference in how negative numbers are compared and ordered:
  - For instance, while 0.7 is greater than 0.2, -0.7 is actually less than -0.2.
  - Since positives and negatives are essentially opposites, the rules for ordering each type of number are applied in a similarly opposite manner.

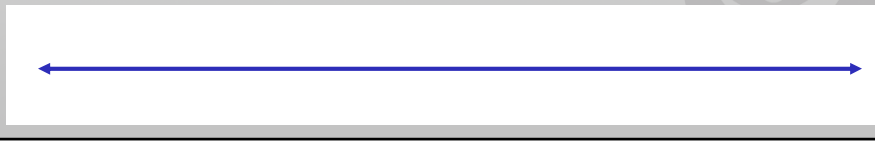
Ordering Fractions and Decimals

Sample Problems:

- Place the following numbers in order of least to greatest: -0.2, $-\frac{1}{2}$, 0.6, $\frac{1}{3}$, 1, 0, $\frac{1}{6}$

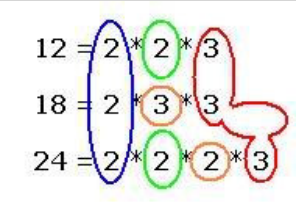
- Place the following numbers in order from greatest to least:$\sqrt{4}$, $1\frac{4}{5}$, 11/5, π, 3.2

- Use the number line below to plot all the numbers listed in questions above.



Q.1.b. Apply number properties involving multiples and factors, such as using the least common multiple, greatest common factor, or distributive property to rewrite numeric expressions.

Test takers generally perform very well on this indicator, which includes questions that include both context or pure computation (no context) and which test factors of a number, multiples of a number, least common multiple, greatest common factor, etc.



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Factors and Multiples

Recommendations for Test-Takers:

No specific recommendations are provided, as the general population of GED® test takers performs well on this indicator.

Factors and Multiples

Sample Problems:

- Find the least common multiple that is necessary to manually perform the indicated operation:

  $\frac{7}{6} - \frac{1}{4}$

- Find the greatest common factor that will help reduce the fraction below into its simplest form.

  $\frac{12}{45}$

- Create a factor tree to transform the number 72 into a product of prime factors.

Rules of Exponents

Q.1.c. Apply rules of exponents in numerical expressions with rational exponents to write equivalent expressions with rational exponents.

This indicator focuses primarily on the following three rules of exponents:

- $(2^m)^n$
- $(2^m)(2^n) = 2^{m+n}$
- $\frac{2^m}{2^n} = 2^{m-n}$

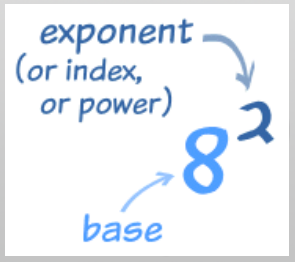
(NOTE: Numbers other than 2 are used as the base for exponential expressions, and numbers are used in place of letters in test items.)

In general, test takers struggle with this indicator—even the least complex items involving only one operation and positive integer exponents. Introducing more complex elements, such as multiple operations, negative or fractional exponents, or coefficients—e.g., 3(24)—only exacerbates difficulties for test takers. Data analysis of items at this indicator suggests that a high degree of guessing may be taking place.

Recommendations for Test-Takers:

Begin from the ground up in learning the concepts contained in this indicator:

- Learn how to calculate numbers raised to a power,
- Move on to the three rules of exponents, and
- Learn to calculate with
  - coefficients,
  - negative powers,
  - fractional powers, and
  - multiple operations.



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Rules of Exponents

Sample Problems:

Simplify the following:

- $x^3 \cdot x^2 =$
- $3^2(3^{-5}) =$
- $x^{-1} * x^{-4} =$
- $(x^3)^5$
- $(3^3)^{-2} =$
- $5(x^3)^{\frac{1}{2}} =$

Distance on a Number Line

Q.1.d. Identify absolute value of a rational number as its distance from 0 on the number line and determine the distance between two rational numbers on the number line,
including using the absolute value of their difference.

This indicator contains two skills:
1) calculating the distance between two points on a number line; and
2) creating and identifying absolute value expressions to model this distance.

Test takers generally perform better on the first type of item, even in instances where a number line is not present as a visual aid.

Test takers perform less well on the second type of item, even though a number line is typically present in items.

Distance on a Number Line

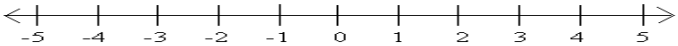
Recommendations for Test-Takers:

- Focus on the calculation of distances between two points on a number line, especially when one or both of the numbers is negative.
- Calculate with all types of numbers, since points on the number line may be represented by integers, decimals, or fractions.
- Focus on the concept of creating and identifying absolute value expressions that model the distance between two points on a number line. (These concepts are very closely related, and may be taught simultaneously or in sequence.)

Distance on a Number Line

Sample Problems:

1. Simplify the following.
   - $|-4| =$
   - $-|-3| =$
   - $-2|3^2 - 10| =$
2. Find the distance between the two points -9 and -3 on a number line.



3. Write an expression for finding the distance between -11 and -2 on a number line.

Check out the IPDAE Website.

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Summary

In this webinar, participants:

- Explored on incorporating Test-Taker Recommendations for Calculator-Prohibited Indicators in daily classroom instruction.
- Reviewed pertinent math concepts and skills tested on the non-calculator section of the GED Math Module through sample problems.
- Discussed best practices and explored resources that will help in developing lessons when covering GED's calculator-prohibited indicators.

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Evaluation

Webinar Evaluation

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