SmackDown Competition – UH Math Contest

SmackDown Format

This is a "Single Elimination" contest. Questions will be projected onto the students' and audience's computer screens using Zoom. All questions are multiple choice. Each question will have a posted time limit of either 10, 20 30, or 45 seconds. Students will use an online answer sheet provided through their login for the contest. A timer will appear on the screen, and when time has expired, the answer sheet will be locked. Students with the correct answer stay in the competition, and those with incorrect answers are eliminated. If no student answers a question correctly, then the current competitors all continue to the next round. This continues until only one student remains. (At the beginning of the competition, we do one or two practice questions so that all students can get used to the interface without being eliminated.)

SmackDown Content

Most questions for the SmackDown will come from Algebra 1, Geometry, and Algebra 2. As the competition advances, some questions may cover concepts from probability, statistics, or Precalculus. In general, the questions get progressively difficult as the competition continues (though difficulty can be subjective).

Calculator Policy

Students ARE permitted to use a calculator in the SmackDown competition, but most students choose to compute the timed problems mentally.

Sample Questions

Some sample types of SmackDown questions are given below. (Multiple choice answers would be provided.)

1. What is the slope of the line $2x - 4y = 6$?
2. What is the vertex of the parabola determined by $f(x) = x^2 - 3x + 1$?
3. What is the length of the line segment from (5, 3) to (9, 7)?
4. Given $f(x) = 5x + 15$, what is x when $y = -20$?
5. Given $2x + 3y = 5$ and $2x + y = -9$, which of the following statements is true?
   A. The lines are parallel.
   B. The lines intersect at (2, 7).
   C. The equations represent the same line.
   D. The lines intersect at (–8, 7).
6. Find a value *t* so that points (0, 2) and (12, *t*) are 13 units apart.
7. Solve for x: $\frac{x}{5-x} = -\frac{2}{11-x}$.
8. Give the smallest value of x solving $2x^2 - 8x = 24 + 4x$.
9. Find the equation of the line that has the same *x* and *y* intercepts as $x^2 + y^2 + 4x - 4y + 4 = 0$.
10. Simplify $\frac{(x^{-1}+2x)^{-1}}{x^2}$.
11. Simplify $|x - 6| + |x - 7|$, given that $6 < x < 7$.
12. Give the average of the solutions to $x^3 + x^2 = 3x$.
13. Given that all real numbers are in the domains and ranges of both f and f^{-1}, and that $f^{-1}(1) = -4$, solve the equation $2 + f(3x + 5) = 3$.
14. Specify the y-intercept for $f(x) = \begin{cases} x^2, & x < -3 \\ x - 5, & -3 \le x \le 3. \\ x + 2, & x > 3 \end{cases}$
15. Simplify $\left(\sqrt{x + x + 1} + \sqrt{a - x + 1}\right)\left(\sqrt{x + x + 1} - \sqrt{a - x + 1}\right)$.