

Smackdown

Questions for the Smackdown will come from Algebra I, Geometry and Algebra II.

All Questions Are Multiple Choice.

This is a “Single Elimination” Contest. Questions will be projected onto the students’ and audience’s computer screens using Zoom. Each question will have a posted time limit of either 10, 20 or 30 seconds. Students will use an 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.

Sample questions are given below:

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

$$f(x) = \begin{cases} x^2, & x < -3 \\ x - 5, & -3 \leq x \leq 3 \\ x + 2, & x > 3 \end{cases}$$

15. Simplify

$$(\sqrt{x+x+1} + \sqrt{a-x+1})(\sqrt{x+x+1} - \sqrt{a-x+1}).$$