

Name: _____

School: _____

**Algebra - Open Event
Math Field Day 2023**

**Write all answers in the form indicated or in exact form. No approximations.
Fractions should be simplified.**

- _____ Find the equation in slope-intercept form of the line that passes through the point (2, -3) and is perpendicular to the line $6x + 3y = 7$.
- _____ Find the vertex of the parabola $f(x) = 2x^2 - 8x + 4$?
- _____ Solve the inequality: $|3x - 8| > 7$. Write your answer(s) as inequalities.
- _____ Write $(3i)^2 - 5(2i) + 8$ in the form $a + bi$.
- _____ Solve: $2x + \sqrt{x + 4} = 4$
- _____ Let $f(x) = 2x - 7$ and $g(x) = \sqrt{3 - x}$. Find $(f \circ g)(-6)$.
- _____ Find the domain of the function: $f(x) = \frac{1}{4 - \sqrt{x}}$.
(Write your answer as an inequality)
- _____ Solve: $\log(6x + 5) - \log 3 = \log 2 - \log(x)$.
- _____ Solve: $2x^2 e^{-x} = 18e^{-x}$.
- _____ Solve the following system of equations for (x, y).
 $2x - y = -1$
 $y = 2x^2 - 3x + 1$
- _____ Find the coefficient of the term containing x^9 in the expansion of $(x + 3)^{14}$.
- _____ Simplify: $\left(\frac{x}{x^2 - 16} - \frac{1}{x + 4}\right) \div \left(\frac{4}{x + 4}\right)$