Name : _____ Algebra 1 Team – Math Field Day 2016 Score _____

_____ 1) Three Postal workers can sort a stack of mail in 15 minutes, 30 minutes, and 45 minutes respectively. Find how long it would take them to sort the same stack of mail if they all worked together?(Round to the nearest minute)

_____ 2) A wire is needed to support a vertical pole 12 feet high, the cable will be anchored 9 feet from the base of the pole. How much cable is needed?

_____ 3) Solve the following for x: $\sqrt{2x+5} + \sqrt{2x} = 3$.

_____ 4) Find the *inverse* of $f(x) = \frac{x}{3} + 2$.

_____ 5) Factor the following completely: $(x+2y)^5 + 7(x+2y)^4 + 12(x+2y)^3$.

_____ 6) What is the minimum value of the product of xy if $x - y = 18$.

_____ 7) Simplify completely using positive rational exponents: $\frac{\sqrt[3]{x^2} * \sqrt[6]{x^{-1}} * \sqrt[4]{x^3}}{-\sqrt[4]{x}}$.

_____ 8) Multiply and divide the following as indicated: $\frac{(z^2-16)}{4} \div \frac{z^2-6z+9}{z^2-z-6} * \frac{4z-8}{z^2+2z-8}$.

_____ 9) Solve $\sqrt{4-x} = x - 2$.

_____ 10) Find the solution set of: $|3x - 2| < \frac{5}{3}$

_____ 11) Solve the equation for x: $6x^3 - 10x^2 = 24x$

_____ 12) Solve for t when:
$$\begin{aligned} 5t + 2h + k &= 1 \\ k + t &= 1 \\ 2t - h &= 1 \end{aligned}$$