

MASSACHUSETTS MATHEMATICS LEAGUE

MARCH 2005

ROUND 4: ALGEBRA ONE ANYTHING

ANSWERS

A) _____

B) _____ Joules

C) _____

A) Find $\{ \text{all real } x \mid \frac{2x-3}{x-3} = \frac{3x-6}{x-3} + 1 \}$.

B) The kinetic energy of a falling object is directly proportional to its mass and the square of its velocity. A quarter has three times the mass of a dime but 5 seconds after they are dropped simultaneously from the top of a building the lesser air resistance means the dime's velocity is 1.25 times that of the quarter. If the dime's kinetic energy at that moment is 250 Joules, what is the kinetic energy of the quarter?

C) If $\frac{a+c}{c} = \frac{d}{e}$ express $\frac{d+e}{ae-ec}$ as a quotient of polynomials containing only a and c