MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 3 - DECEMBER 2016
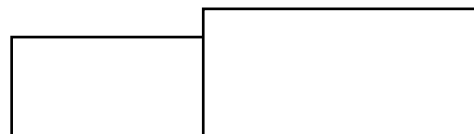## ROUND 5 ALG 1: RATIO, PROPORTION OR VARIATION

ANSWERS

A) _____

B) _____

C) _____

A) Suppose the amount of light reflected by a set of mirrors is directly proportional to the surface area of the mirrors. 50 lumens of light are reflected off a mirror whose dimensions are 3 inches by 5 inches. How many lumens of light are reflected off two mirrors placed side-by-side made of the same material given that the first is 4 inches by 6 inches and the second is 5 inches by 9 inches?

B) Given: $\begin{cases} \dfrac{A}{B} = \dfrac{7}{9} \\ \dfrac{C}{D} = \dfrac{5}{3} \end{cases}$ If $B = 4D$, compute $\dfrac{A+B}{C+D}$.

C) As a 3-point shooter in basketball, I have currently hit on 60% of my attempts. If 8 of my hits had been misses, I would have only been a 50% 3-point shooter. Suppose I hit on my next k 3-point shots. What is the minimum value of k for which I hit at least 70% of my 3-point attempts?