

**MASSACHUSETTS MATHEMATICS LEAGUE  
CONTEST 4 - JANUARY 2010  
ROUND 6 ALG 1: ANYTHING**

**ANSWERS**

A) \_\_\_\_\_

B) \_\_\_\_\_

C) \_\_\_\_\_ minutes \_\_\_\_\_ seconds

<b>***** NO CALCULATORS IN THIS ROUND *****</b>
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A) Compute:  $\left( \sqrt{8} - \frac{1}{\sqrt{2} - \frac{1}{\sqrt{2}}} \right)^2$

B) Write as a single simplified fraction with no negative exponents.

$$\left( \frac{1}{a+b} - \frac{1}{a-b} \right) (a^{-1} - b^{-1})$$

Note: For any real number  $x \neq 0$ ,  $x^{-1}$  is equivalent to  $\frac{1}{x}$ .

C) On the interstate Mario traveling 100 mph passed a state trooper with a radar gun parked beside the road. The trooper immediately decided to give chase. 48 seconds after Mario passed the state trooper's parked car, the trooper had gone 1/6 of a mile and had reached his top speed of 121 mph, which he maintained until he overtook Mario. How long after Mario passed the trooper was he apprehended? Express your answer in minutes and seconds, accurate to the nearest second.