

MASSACHUSETTS MATHEMATICS LEAGUE
MARCH 2004
ROUND 4: ALGEBRA I ANYTHING

ANSWERS

A) 1002

B) 11:10 $\frac{10}{11}$

C) A = 22, B = 17, C = 54

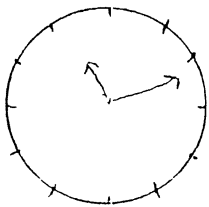
A) The difference of the squares of two consecutive positive even integers is 2004. What is the sum of these two integers?

$$x, x+2 \quad (x+2)^2 - x^2 = 2004, \quad (x+2+x)(x+2-x) = 2004$$

$$2(2x+2) = 4(x+1) = 2004, \quad x+1 = 501, \quad x = 500,$$

$$x+2 = 502, \quad \underline{\text{Ans}} \quad 1002$$

B) What is the exact time after 11 o'clock when the hands of a clock first form a ninety degree angle?



$$(x+5) - \frac{x}{12} = 15$$

$$x - \frac{x}{12} = 10$$

$$12x - x = 120$$

$$11x = 120$$

$$x = 10 \frac{10}{11}$$

Ans 11:10 $\frac{10}{11}$

C) Two persons A and B together have fifteen dollars less than a third person C. If A gives \$4 to B, then A's amount of money will be one-third of C's. If, instead, B gives \$4 to A, then A will have twice as much money as B. How many dollars does each person have?

$$A + B = C - 15$$

$$A + B - C = -15$$

$$2A - B = 27$$

$$A - 4 = \frac{1}{3}C$$

$$3A - C = 12$$

$$A - 2B = -12$$

$$A + B = 39$$

$$A + 4 = 2(B - 4)$$

$$A - 2B = -12$$

$$3A = 66, A = 22$$

$$B = 17$$