MASSACHUSETTS MATHEMATICS LEAGUE
NOVEMBER 2003
ROUND 2: ALGEBRA I ANYTHING

ANSWERS

A) $2000

B) 2/3, 4

C) 5

A) Sharnell could earn a weekly salary of $200 plus 15% commission of sales at the Radio Barn, or she could earn $300 plus 10% commission on sales at Woofen Etc store. Compute the dollar amount of sales Sharnell would have to sell to generate the same salary at each business.

$200 + .15x = 300 + .10x$

$.05x = 100$

$x = 2000$

B) Solve for x: $\frac{3}{x-1} - \frac{14}{x^2} = \frac{6}{x^3 - x^2}$.

$3x^2 - 14(x-1) = 6$

$3x^2 - 14x + 14 = 6$

$3x^2 - 14x + 8 = 0$

$(3x - 2)(x - 4) = 0$

$x = 2/3, 4$

C) If the graph of $\{(x, y): y = ab^x\}$ contains the points (0, 3) and (3, 24); compute the value of a + b.

$ab^0 = 3, \quad a = 3$

$3b^3 = 24, \quad b^3 = 8, \quad b = 2 \quad a + b = 5$