MASSACHUSETTS MATHEMATICS LEAGUE
JANUARY 2004
ROUND 4: QUADRATICS

ANSWERS

A) ± 8

B) 100

C) 4

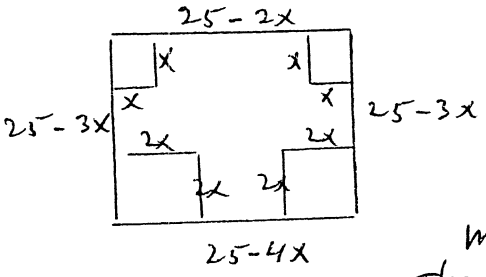
A) For what values of k will the equation $2x^2 - kx + 8 = 0$ have two equal real roots?

$k^2 - 4(2)(8) = 0$

$k^2 - 64 = 0$

$k = \pm 8$

B) The area of a square piece of tin is 625 sq in. Squares of equal size are cut out of the two top corners. Larger squares, each four times the area of a top corner square, are cut out of the two bottom corners. Calculate the perimeter of the resulting figure if its area is 535 sq. in.



$P = \left.\begin{matrix} 50 - 6x \\ 50 - 6x \\ 4x \\ 8x \end{matrix}\right\} = 100$

method 2: Solve To get $x = 3$.
Then add: $24 + 13 + 32 + 12 + 19 = 100$

C) If one root of $ax^2 + bx + c = 0$ is x = -2, b + c = 0, and a + b = 7; find the value of b

$x = -2,\ 4a - 2b + c = 0,\ c = -b,\ a = 7 - b$

$4(7 - b) - 2b - b = 0$

$28 - 7b = 0$

$b = 4$