MASSACHUSETTS MATHEMATICS LEAGUE
JANUARY 2004
ROUND 2: FACTORING & APPLICATIONS

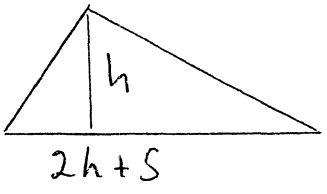
ANSWERS

A) 21

B) $-19, -17, -15$

C) $x(2x-3)(x-2)(x^2+2x+4)$

A) The base of a triangle is five more than twice the altitude to that base If the area of the triangle is 84, calculate the length of the base



$\frac{1}{2}h(2h+5) = 84$

$2h^2 + 5h - 168 = 0$

$(2h+21)(h-8) = 0$

$h = 8,\ 2h+5 = 21$

B) Find three consecutive odd integers such that the product of the first and the third added to the sum of all three is 234

$x,\ x+2,\ x+4$

$x(x+4) + (3x+6) = 234$

$x^2 + 7x - 228 = 0$

$(x+19)(x-12) = 0$

$x = -19$

ANS $-19, -17, -15$

C) Factor $2x^5 - 3x^4 - 16x^2 + 24x$

$x^4(2x-3) - 8x(2x-3) = x(2x-3)(x^3-8) =$

$x(2x-3)(x-2)(x^2+2x+4)$