

**University of Colorado**  
**Department of Mathematics**  
**Problem of the Month**  
**October 2008**

Let integers  $a_n, b_n, c_n$  and  $d_n$  be such that

$$(1 + \sqrt{2} + \sqrt{3})^n = a_n + b_n\sqrt{2} + c_n\sqrt{3} + d_n\sqrt{6}$$

Find the limits

$$\lim b_n/a_n, \quad \lim c_n/a_n, \quad \lim d_n/a_n$$