



22. Which positive integer n satisfies the equation

$$\frac{3}{n^3} + \frac{4}{n^3} + \frac{5}{n^3} + \dots + \frac{n^3 - 5}{n^3} + \frac{n^3 - 4}{n^3} + \frac{n^3 - 3}{n^3} = 60?$$

A 5

B 11

C 31

D 60

E 2006

0692



©UKMT

-
22. A The terms on the left-hand side of the equation form an arithmetic progression which has $n^3 - 5$ terms. So the sum of these terms is $\frac{n^3 - 5}{2} \left(\frac{3}{n^3} + \frac{n^3 - 3}{n^3} \right) = \frac{n^3 - 5}{2}$. Hence $n^3 - 5 = 120$, so $n = 5$.