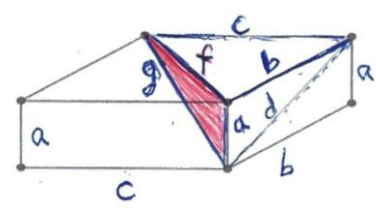
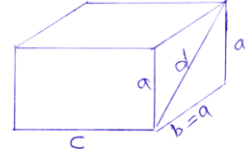


Euler Perfect Box

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$a, b, c, d, e, f, g \in N_+ \Leftrightarrow$ Euler Perfect Box (EPB)

Proof:

A) Let $a < b < c$, let $a, b, c \in N_+$. & let $N_{\text{Square}} = N_S$ $\therefore g^2 = a^2 + b^2 + c^2 = b^2 + a^2 + c^2 \dots 1$ $\therefore a < b < c \Rightarrow a^2 < bc < 2bc$ $\Rightarrow a^2 < 2bc \dots 2$ $\therefore g^2 = b^2 + a^2 + c^2 \neq (b + c)^2 \Rightarrow$ $g^2 \neq (b + c)^2 \Rightarrow$ $g^2 \notin N_S \Rightarrow g \notin N_+ \Rightarrow \nexists EPT$	
B) if $a = b < c$ $\therefore d^2 = a^2 + b^2$ $\therefore d^2 = a^2 + a^2 \Rightarrow d^2 = 2a^2 \Rightarrow$ $d = \sqrt{2} a \Rightarrow d \notin N_+ \Rightarrow \nexists EPT$	
c) if $a = b = c$ $\therefore d^2 = a^2 + b^2$ $\therefore d^2 = a^2 + a^2 = 2a^2$ $\therefore d^2 = 2a^2 \Rightarrow d = a\sqrt{2} \Rightarrow d \notin N_+$ $\Rightarrow \nexists EPT$	