

# Mathematics Problem of the Week (251)

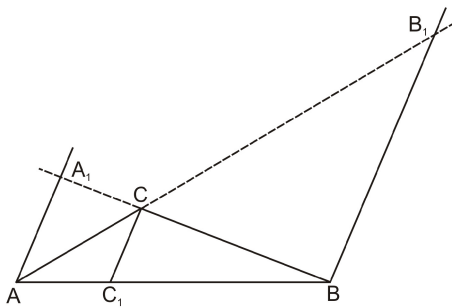
This week's winner is:

**David Luna**

**There were no other correct solutions to problem 251.**

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**Problem 251 solution:**



Because  $BB_1$  is parallel to  $CC_1$  triangles  $AB_1B$  and  $ACC_1$  are similar. Thus  $\frac{BB_1}{CC_1} = \frac{AB}{AC_1}$ .

$$\text{So } \frac{1}{BB_1} = \frac{AC_1}{AB \cdot CC_1}.$$

Because  $AA_1$  is parallel to  $CC_1$  triangles  $AA_1B$  and  $CC_1B$  are similar. Thus  $\frac{AA_1}{CC_1} = \frac{AB}{BC_1}$ .

$$\text{So } \frac{1}{AA_1} = \frac{BC_1}{AB \cdot CC_1}.$$

$$\text{Then } \frac{1}{AA_1} + \frac{1}{BB_1} = \frac{BC_1}{AB \cdot CC_1} + \frac{AC_1}{AB \cdot CC_1} = \frac{BC_1 + AC_1}{AB \cdot CC_1} = \frac{AB}{AB \cdot CC_1} = \frac{1}{CC_1}.$$