



**MATHEMATICS CHALLENGE FOR YOUNG  
AUSTRALIANS  
INTERMEDIATE: YEARS 9 and 10  
WARM UP PROBLEM 03**

**Squared Fractions**

The fraction  $\frac{1}{20}$  can be written as the sum of the reciprocals of two squares:

$$\frac{1}{20} = \frac{1}{5^2} + \frac{1}{10^2}.$$

1. Show that  $\frac{1}{72}$  cannot be written as the sum of the reciprocals of the squares of two different positive integers.
2. Write  $\frac{1}{72}$  as the sum of the reciprocals of the squares of three different positive integers.
3. Write  $\frac{1}{8}$  as the sum of the reciprocals of the squares of different positive integers, using as few terms as possible.