# Math Diversion 725

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> In every area of mathematics there are one or
> two really key ideas that capture all
> the important ideas.
> — Richard Bocherds

The problem is found at:

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Source: https://www.basic-mathematics.com/
     hard-word-problems-in-algebra.html
Title: Problem #53
 Presenter: Patrick
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## 1 Problem

Find three consecutive integers such that one half of their sum is between 15 and 21.

## 2 Solution

Three consecutive integers could look like this: $x$, $x+1$, $x+2$. Half of their sum is $\frac{1}{2}(3x+3)$, which is to lie between[1] 15 and 21. So,

$$15 < \tfrac{1}{2}(3x+3) < 21\,. \tag{1}$$

First, let's divide through by 3:

$$5 < \tfrac{1}{2}(x+1) < 7\,, \tag{2}$$

and then multiply through by 2 and then subtract one:

$$9 < x < 13\,. \tag{3}$$

Our possible triplet is $\{10, 11, 12\}$.

[1] I'm treating the word 'between' as meaning that the end values are excluded.