



Amongs



John Mason

**MathsJam 2011**

**Write down a sequence of 7 integers**

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**Eg: 1 9 3 5 11 1 6**

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The sum of some 5 of them is divisible by 3

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Eg:  $\textcircled{1} \textcircled{9} 3 \textcircled{5} \textcircled{11} \textcircled{1} 6$

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The sum of some 3 of them is divisible by 5

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Let  $p$  &  $q$  be primes

Write down a sequence of

$n = p + q - 1$  integers

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Place a (large) tennis ball on the floor

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Note the 'north pole'

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For which curves will the same point  
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**... and the sphere be in the original orientation?**

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Choose a curve on the sphere

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Roll the sphere so the points on this curve are the  
contact points with the floor

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... and the sphere be in the original orientation?

Choose a curve on the sphere

Roll the sphere so the points on this curve are the  
contact points with the floor

For which curves does the sphere end up with the same