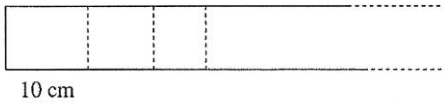
Want more revision exercises? Get **MathsFit** - *New from projectmaths.*

12	**15a**	Rectangles of the same height are cut from a strip and arranged in a row. The first rectangle has width 10 cm. The width of each subsequent rectangle is 96% of the width of the previous rectangle.  (i) Find the length of the strip required to make the first ten rectangles. (ii) Explain why a strip of length 3 m is sufficient to make any number of rectangles.	**2** **1**

10, 9.6, ...

(i) $a = 10$, $r = 0.96$, $n = 10$

$$S_n = \frac{a(1-r^n)}{1-r}$$

$$= \frac{10(1-0.96^{10})}{1-0.96}$$

$$= 83.791841 \ldots$$

$$= 83.79 \text{ (2 dec pl)}$$

The strip would be 83.79 m

(ii) lim sum $= \frac{a}{1-r}$

$$= \frac{10}{1-0.96}$$

$$= 250$$

As limiting sum is 250, then the strip has a maximum length of 250 cm, or 2.5 m, which means that 3 m is sufficient.

State Mean:
1.60/2
0.58/1

* These solutions have been provided by *projectmaths* and are not supplied or endorsed by the Board of Studies

Board of Studies: Notes from the Marking Centre

(i) Responses that correctly identified the geometric progression usually obtained full marks. Simple addition of 10 terms in geometric progression was a successful technique, although this frequently led to rounding errors and took extra time. A common error was to find the tenth term rather than the sum of the first ten terms.

(ii) Candidates who correctly interpreted the need for a limiting sum were usually successful. In some responses, candidates did not realise that when an explanation is required, they need to supply some justification. Some candidates offered only a response with no calculations and did not come up with a limiting sum.

Source: http://www.boardofstudies.nsw.edu.au/hsc_exams/

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