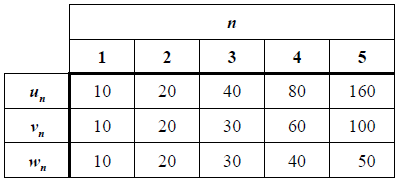
# 1.3 Geometric Sequence and series\_P\_1

**1a.** *[1 mark]*

The table shows the first five terms of three sequences: *u* , *v* and *w*.



State which sequence is arithmetic.



**1b.** *[1 mark]*

State which sequence is geometric.



**1c.** *[2 marks]*

Find the exact value of the 11th term of the geometric sequence.



**1d.** *[2 marks]*

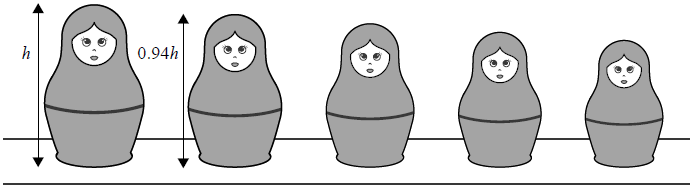
Find the sum of the first 20 terms of the arithmetic sequence.



**2a.** *[3 marks]*

Matryoshka dolls, or Russian dolls, are similarly designed dolls which open up and fit inside each other.

The largest set of these type of dolls is a 51 piece set which was completed in 2003. The height of the largest piece in this set is 54 cm. The heights of successive smaller dolls are 94 % of the preceding larger doll, as shown.



Find the height of the smallest doll in this set.



**2b.** *[3 marks]*

Find the **total** height if all 51 dolls were placed one on top of another.



**3a.** *[2 marks]*

The first three terms of a geometric sequence are .

Find the value of , the common ratio of the sequence.



**3b.** *[2 marks]*

Find the value of  for which .



**3c.** *[2 marks]*

Find the sum of the first 30 terms of the sequence.



**4a.** *[1 mark]*

Consider the geometric sequence .

Write down the common ratio of the sequence.



**4b.** *[2 marks]*

Find the value of .



**4c.** *[3 marks]*

Find the smallest value of  for which  is less than .



**5a.** *[2 marks]*

A hydraulic hammer drives a metal post vertically into the ground by striking the top of the post. The distance that the post is driven into the ground, by the  strike of the hammer, is .

The distances  form a geometric sequence.

The distance that the post is driven into the ground by the first strike of the hammer, , is 64 cm.

The distance that the post is driven into the ground by the second strike of the hammer, , is 48 cm.

Find the value of the common ratio for this sequence.



**5b.** *[2 marks]*

Find the distance that the post is driven into the ground by the eighth strike of the hammer.



**5c.** *[2 marks]*

Find the **total depth** that the post has been driven into the ground after 10 strikes of the hammer.



**6.** *[3 marks]*

The second term of an arithmetic sequence is 30. The fifth term is 90.

The first, second and fifth terms of this arithmetic sequence are the first three terms of a geometric sequence.

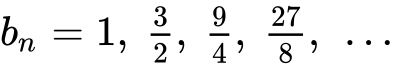
Calculate the seventh term of the **geometric** sequence.

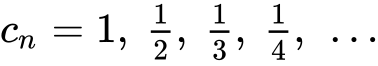


**7a.** *[2 marks]*

Only one of the following four sequences is arithmetic and only one of them is geometric.









State which sequence is

(i)     arithmetic;

(ii)     geometric.



**7b.** *[1 mark]*

For **another** geometric sequence 

write down the common ratio;



**7c.** *[3 marks]*

For **another** geometric sequence 

find the **exact** value of the tenth term. Give your answer as a fraction.



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