

2021 Worksheet 3 Year 12 Mathematics

Write the answers in your Exercise Book.

1. Calculate the next 4 terms of the following **recursively** defined sequence.

$$T_1 = 2,$$

$$T_n = T_{n-1} + 10$$

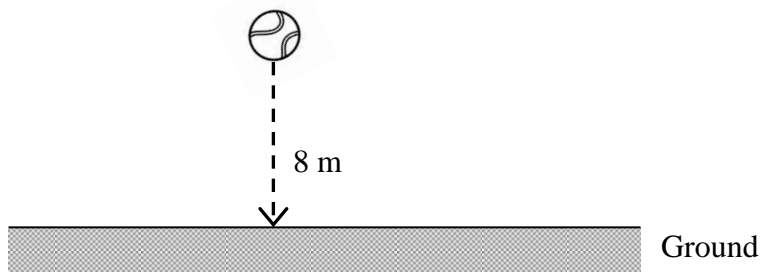
(2 marks)

2. The sum to infinity of a geometric sequence is given by $S_\infty = \frac{a}{1-r}$

(a) Under what circumstances does a geometric sequence have a **sum to infinity**?

(1 mark)

(b) A ball is dropped from a height of 8 m. With each bounce it rises to 75% of its previous height.



Calculate the **total distance** travelled by the ball before it comes to rest.

(2 marks)

3. Tima borrowed some money from a bank. The successive interest payments were

\$348, \$344, \$340, \$336, ...

(a) How many interest payments would be made by the time the loan is fully paid off? $[T_n = a + (n-1)d]$

(2 marks)

(b) Find the total amount that would be paid in interest while repaying the loan. $[S_n = \frac{n}{2}[2a + (n-1)d]$

(2 marks)