

1 Which of the following are geometric sequences?

- (a) 1, -2, 4, -8, 16, -32...
- (b) 1, -2, 3, -4, 5, 6...
- (c) 16, 8, 4, 2, 1...
- (d) 26, 18, 14, 12, 11...
- (e) $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6} \dots$
- (f) $\frac{3}{2}, \frac{3}{6}, \frac{3}{18}, \frac{3}{54}, \frac{3}{96} \dots$

2 For each of the geometric sequences in question 1, find the first term, a , and the common ratio, r .

3 A financial company advertises that it doubles the value of money invested with it every 6 years.
If Simon invests \$100, how much will he have in 24 years time?

4 Find the 7th term of the following sequences where:

- (a) $a = 1, r = 2$
- (b) $a = 2, r = 3$
- (c) $a = 3, r = 2$
- (d) $a = 3, r = 3$

5 The 3rd term of a geometric sequence is 45, while the 6th term is -1215. Find a and r .

6 An ancient legend has it that a wise man once saved a king's life. The king said that the wise man could have anything that the king could give him. So, the wise man said "...give me one grain of rice in the first square of a chessboard, 2 grains of rice in the 2nd square, 4 grains of rice in the 3rd, and so on for all 64 squares".

- (a) Find a and r in this geometric sequence.
- (b) How many grains of rice in the last square?

7 Find the sum of 6 terms of the following series.

- (a) $a = 5, r = 2$
- (b) $a = 5, r = \frac{1}{2}$
- (c) $a = 10, r = 2$
- (d) $a = 10, r = \frac{1}{2}$

1 Determine which of the following are arithmetic sequences.

- (a) 5, 11, 25, 31, 45, 51...
- (b) 5, 12, 19, 26, 33, 40...
- (c) 92, 83, 74, 65, 56...
- (d) -10, 9, -8, 7, -6, 5, -4...
- (e) -10, -12, -14, -16, -18...
- (f) 3.1, 4.0, 4.9, 5.8, 6.7...

2 For the sequences in question 1 which are arithmetic sequences, state a , the starting term and d , the common difference.

3 Each week, Mary saves \$45 of her wages. Write the arithmetic sequence which represents her total savings for the first 7 weeks of work.

4 Find the 10th term, t_{10} , for the following sequences.

- (a) $a = 3, d = 7$
- (b) $a = 10, d = -2.2$
- (c) $a = -30, d = 4.1$
- (d) $a = 120, d = -6$

5 Find d , the common difference for arithmetic sequences where:

- (a) $a = 5, t_4 = 6$
- (b) $t_1 = 2, t_5 = 14$
- (c) $t_2 = 5, t_{10} = 55$
- (d) $t_2 = 9, t_3 = 3$

6 Find the sum of the first 10 terms of an arithmetic series where:

- (a) $a = 3, d = 6$
- (b) $a = 3, d = -6$
- (c) $a = 3, t_5 = 17$

7 A small sporting club starts with 10 members and increases its membership by 6 each year. The fees started at \$100 per year, increasing by \$12 each year.
How much money is collected over 8 years?

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