ARITHMETIC SEQUENCES

1 Which of the following are arithmetic sequences?

(a) $7, 17, 27, 37, \ldots$ **(b)** $5, 2, -1, -4, \ldots$ **(c)** $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \ldots$

(d) $\frac{5}{8}, 1, 1\frac{3}{8}, 1\frac{3}{4}, \ldots$ **(e)** $\sqrt{2}-1, \sqrt{2}+1, \sqrt{2}+3, \sqrt{2}+5, \ldots$ **(f)** $\pi, \pi^2+1, \pi^3+2, \pi^4+3, \ldots$

2 For the arithmetic sequence $5, 8, 11, 14, \ldots$ find:

(a) the value of a **(b)** the value of d **(c)** the expression for T_n

(d) the 13th term **(e)** the value of k if $T_k = 98$.

4 Find the eighth and fourteenth terms of the arithmetic sequence 8, 14, 20, 26, … .

5 For the arithmetic sequence 17.2, 16.6, 16, 15.4, … , find T_6 and T_{11}.

6 The first and second terms of an arithmetic sequence are p and q respectively. Write an expression for the tenth term.

8 Find the arithmetic sequence in which $T_5 = 17$ and $T_{12} = 52$.

9 Find T_6 of the arithmetic sequence in which $T_3 = 5.6$ and $T_{12} = -7$.

11 Find the value of p so that $p + 5, 4p + 3, 8p - 2$ form the first three terms of an arithmetic sequence.

13 The first term of an arithmetic sequence is -8 and the seventh term is 22. Find the missing five terms of the sequence.

15 Given 36, 31, 26, are the first three terms of an arithmetic sequence, find the value of n if the nth term is -4.

17 The lengths of the sides of a right-angled triangle form the terms of an arithmetic sequence. If the hypotenuse is 25 cm long, find the lengths of the other two sides.

19 Alexandra starts a new job with an initial salary of \$28 000 per annum. She is promised an increase of \$300 per quarter for the first 4 years of her employment.

(a) What will her salary be in 3 months time?
(b) Write an expression for her salary, S, in dollars after n quarters.
(c) What is the domain of the function $S(n)$?
(d) What is the maximum salary that she can expect to receive?

20 $1000 is borrowed for two years at a simple interest rate of 0.5% per month, with the interest added monthly.

(a) How much interest is added each month?

(b) How much is owed after 1 month?

(c) How much is owed after one year?

(d) How much is to be paid back at the end of two years?