Chapter 14  Solving equations

Question 1
Solve the equation $5(x + 2) = 13$

Question 2
Solve the equation $\frac{3}{x + 1} = \frac{2}{4x + 1}$

Question 3
Solve the simultaneous equations

\[
\begin{align*}
    x - 3y &= -13 \\
    4x + 2y &= -24
\end{align*}
\]

Question 4
Solve the quadratic equation $x^2 + 3x - 4 = 0$ by factorization

Question 5
Solve the quadratic equation $x^2 + 3x - 4 = 0$ by the formula

Chapter 15  Sequences and series

Question 1
Write down the first five terms of the sequence given by $x_k = 3k$

Question 2
Write down the first five terms of the arithmetic progression with common difference 7 and the first term 2.

Question 3
Find the $23^{rd}$ term of the arithmetic progression with the first term 11 and common difference -3
Question 4

A geometric progression has first term 4 and common ratio 2. Write down the first five terms.

Question 5

Using the formula, what is the 5th term of a geometric progression with the first term 2 and common ratio $\frac{1}{2}$?

Question 6

Find the limit of the infinite sequence $x_k = \frac{k + 1}{k}, k = 1, 2, 3...$

Question 7

Write out what is meant by $\sum_{k=0}^{\infty} (2k + 1)^2$

Question 8

Find the sum of the first 12 terms of the arithmetic series with the first term 10 and common difference 8.

Question 9

Find the sum of the first 6 terms of the geometric series with the first term 2 and common difference 3.

Question 10

Find the sum of the infinite geometric series with the first term -8 and common ratio 0.25

Chapter 16  Functions

Question 1

Given the function $f(x) = 2x^2 - 3$, what is $f(3)$ and $f\left(\frac{1}{2}\right)$?

Question 2

Given that $f(x) = 4x + 3$ and $g(x) = 3x - 2$ find $f(g(x))$ and $g(f(x))$
Question 3

Find the inverse function of \( f(x) = -\frac{3}{4x} + 5 \)

Chapter 17    Graphs of functions

Question 1

(a) Plot a graph of the function \( f(x) = x^2 - x - 1 \) for \(-2 \leq x \leq 3\)

(b) State the coordinates of the points where the curve cuts the horizontal axis and where it cuts the vertical axis.

(a) What is the domain of the function?

(d) What is the range of the function?

Question 2

Solve the equation \( x^2 + 5x + 6 = 0 \) graphically.

Question 3

Solve the following simultaneous equations graphically.

\[
\begin{align*}
3x + 2y &= 4 \\
x - y &= 3
\end{align*}
\]

Chapter 18    The straight line

Question 1

Find the equation of the line that passes through the two points (2,2) and (3,8).

Question 2

Determine the equation of the straight line passing through the point (-1,-6) and parallel to the line \( y = 3x + 17 \).
Question 3

Draw the graph of $y = 2x^2 - 1$ for values of $x$ between -3 and 3. By drawing a tangent, estimate the gradient of the curve at point (0.5, -0.5).