1. (a) \[ x^3 + 2x^2 - 5 = 0 \]
\[
\begin{align*}
 f(1) &= 1^3 + 2(1)^2 - 5 = -2 \\
f(2) &= 2^3 + 2(2)^2 - 5 = 8 + 8 - 5 = 11
\end{align*}
\]

Since \[ f(1) < 0 \]
and \[ f(2) > 0 \] a root lies between 1 and 2.

(b) \[ f(1.5) = 1.5^3 + 2(1.5)^2 - 5 = 3.375 + 4.5 - 5 = 2.875 \]

Between 1 and 1.5 = 2.875

\[ f(1.3) = 1.3^3 + 2(1.3)^2 - 5 = 1.69 + 3.38 - 5 = 0.07 \]

Between 1 and 1.3

\[ f(1.2) = 1.2^3 + 2(1.2)^2 - 5 = 1.728 + 2.88 - 5 = -0.392 \]

Between 1.2 and 1.3.

\[ f(1.25) = 1.25^3 + 2(1.25)^2 - 5 = 0.078125 \]

Between 1.2 and 1.25

Root is

\[ f(1.24) = -0.018176 \]

Between 1.24 and 1.25

\[ f(1.245) = 0.029831125 \]

Root is between 1.24 and 1.245

Root is \[ 1.24 \] to 2 d.p.
2 (a) \( x^3 - 3x^2 - 6 = 0 \)
\[
\begin{align*}
  f(3) &= 3^3 - 3(3)^2 - 6 = -6 \\
  f(4) &= 4^3 - 3(4)^2 - 6 = 10 \\
\end{align*}
\]
Since \( f(3) < 0 \) and \( f(4) > 0 \) root lies between 3 and 4.

(b) \( f(3.4) = -1.376 \)
\[
\begin{align*}
  f(3.6) &= 1.1776 \\
  f(3.5) &= 0.125 \\
  f(3.45) &= -0.643875 \\
  f(3.48) &= -0.187008 \\
  f(3.49) &= -0.031751 \\
  f(3.495) &= 0.04643778 \\
\end{align*}
\]
Root is 3.49 to 2 d.p.

3. (a) \( y = x^3 - 3x^2 - 9x - 3 \)
\[
\begin{align*}
  f(-2) &= (-2)^3 - 3(-2)^2 - 9(-2) - 3 \\
  &= -8 - 12 + 18 - 3 \\
  &= -5 \\
  f(-1) &= (-1)^3 - 3(-1)^2 - 9(-1) - 3 \\
  &= -1 - 3 + 9 - 3 \\
  &= 2 \\
\end{align*}
\]
Since \( f(-2) < 0 \) and \( f(-1) > 0 \) a root lies between -1 and -2.
3 (a) continued

\[ y = x^3 - 3x^2 - 9x - 3 \]
\[ f(4) = 4^3 - 3(4^2) - 9(4) - 3 \]
\[ = 64 - 48 + 36 - 3 \]
\[ = 23 \]
\[ f(5) = 5^3 - 3(5^2) - 9(5) - 3 \]
\[ = 125 - 75 - 45 - 3 \]
\[ = f(5) = 2 \]

Since \( f(4) < 0 \) and \( f(5) > 0 \)
a root lies between 4 and 5.

\[ f(1) = (-1)^3 - 3(-1)^2 - 9(-1) - 3 \]
\[ = -1 - 3 + 9 - 3 \]
\[ = 2 \]
\[ f(0) = -3 \]

Since \( f(1) > 0 \) and \( f(0) < 0 \)
a root lies between -1 and 0.

(b) \( f(4.8) = -4.728 \)

between 4.8 and 5

\[ f(4.9) = -1.489 \]

between 4.8 and 4

\[ f(4.88) = -2.148928 \]

between 4.88 and 4

\[ f(4.89) = -1.916131 \]

between 4.89 and 4

\[ f(4.885) = -1.9828209 \]

between 4.885 and

\[ f(4.895) = -1.6488576 \]

between 4.895 and
\( f(4.94) = \)

\[ x^3 - 3x^2 + 5x - 4 = 0 \]

\( f(1) = 1^3 - 3(1)^2 + 5(1) - 4 = 1 - 3 + 5 - 4 = -1 \)

\( f(2) = 2^3 - 3(2)^2 + 5(2) - 4 = 8 - 12 + 10 - 4 = 2 \)

Between 1 and 2.

\( f(1.4) = \)
5. \[ x^3 - 6x^2 - 2 = 0 \]
\[ f(6) = \]

6. At point of intersection

\[ 2x^2 - 3 = x^3 - 7x + 6 \]
\[ x^3 - 9x + 9 = 0 \]

\[ f(1) = 1^3 - 9(1) + 9 = 1 - 9 + 9 = 1 \]
\[ f(2) = 2^3 - 9(2) + 9 = 8 - 18 + 9 = -1 \]

Between 1 and 2

\[ f(1.5) = 1.5^3 - 9(1.5) + 9 = \]