Mark schemes

Q1.

x_2 = 2 and x_3 = 3.5

M1

x_4 = 3.83(6...) and x_5 = 3.86(4...)

M1

3.87

A1

[3]

Q2.

Correctly evaluated trial

such that root < trial ≤ 6

  e.g. 6^3 – 20 × 6 = 96 Too big

  Obtains 5 < x < 6 or better (need not be stated)

M1

Improved trial

  5 < Trial < 1st trial

  e.g. 5.5^3 – 3 × 5.5 = 56.(375) or 56.4 Too small

  5.1 → 30.(6…) or 30.7 5.2 → 36.(6…)
  5.3 → 42.(8…) or 42.9
  5.4 → 49.(4…) or 46.5
  5.5 → 56.(3…) or 56.4

M1

Obtains 5.5 ≤ x ≤ 5.6
or better

or Two correct trials [5.55, 5.65] which
bracket 60

  5.6 → 63.(6…)
  5.7 → 71.(1…) or 71.2
  5.8 → 79.(1…)
  5.9 → 87.(3…) or 87.4
  5.55 → 59.(95)
  5.56 → 60.(6…) or 60.7

A1

Tests 5.55 and concludes 5.6

  Using 2 dp to ensure 1 dp
  Strand (ii)

or Two correct trials [5.55, 5.65] which
bracket 60 and 5.6 for final answer

A1

[4]

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Q3.

$x_2 = 0.25$

oe

M1

0.3218… or 0.3222…

oe

A1

0.32

ft their 3 dp value or better

B1ft

[3]

Q4.

2.2 ➜ 28(.248) (and too small)

or Trial evaluated correctly for

If equation has been rearranged to equal 0

2.2 ➜ –(1.752)

2.2 < trial < root

If equation has been rearranged to 0 =

2.2 ➜ +(1.752)

B1

2.3 ➜ 30.5(67) (and too big)

or Trial evaluated correctly for

If equation has been rearranged to equal 0

2.3 ➜ +(0.567)

root < trial < 2.3

If equation has been rearranged to 0 =

2.3 ➜ –(0.567)

Note: Root is $x = 2.276…$

B1

[2]

Q5.

(a) $-\dfrac{1}{2}$ or –0.5

B1

$-\dfrac{25}{64}$ or –0.390625

ft their $-\dfrac{1}{2}$

B1ft

(b)　−0.381966

$$ft\ their\ -\frac{25}{64}$$

B1ft

[3]

Q6.

    (a)   Valid explanation

e.g.1　3 or 3.4 labelled in correct place on the x-axis and marking on graph corresponding to V = 50

e.g. 2　3 labelled in correct place on the x-axis and markings on graph corresponding to x = 3 and x = 4

                oe

                B1 Partial explanation

                e.g.1 Marking on graph corresponding to V = 50

                e.g.2 Markings on graph corresponding to x = 3 and x = 4

                SC1 Marking on graph corresponding to 40 < V < 80 (not 50) with 3 or value between 3 and 4 labelled in correct place on the x-axis

B2

    (b)   Two correct trials [3.25, 3.35] which bracket 50 and 3.3 as the answer

                B2 Two correct trials [3.25, 3.35] which bracket 50 and 3.3 not the answer

                or

                Two correct trials [3.3, 3.4] which bracket 50 and 3.3 as the answer

                B1 One correct trial 3 < x < 4

B3

[5]