

Question 1

$$\frac{11-x}{(3-x)(1+x)}$$

$$\frac{2(1+x)+3(3-x)}{(3-x)(1+x)}$$

$$\frac{11-x}{(3-x)(1+x)} \text{ oe isw}$$

B1

B1

Question 2

$$3\left(x - \frac{5}{6}\right)^2 - \frac{13}{12}$$

$$3\left(x^2 - \frac{5}{3}x\right) + 1$$

$$3\left[\left(x - \frac{5}{6}\right)^2 - \frac{25}{36}\right] + 1$$

$$3\left(x - \frac{5}{6}\right)^2 - \frac{13}{12}$$

B1

B1

M1

A1

Question 3

$$x = -3 \text{ or } x = 1$$

$$k = x^3$$

$$k^2 + 26k - 27 = 0$$

$$k = -27, 1$$

$$x = -3, 1$$

*M1

A1

A1

DM1

A1

Question 4

$$x = -2.19$$

$$32(2^{2x}) - 7(2^x) = 0$$

Deals with power 5 correctly giving $\times 32$ | M1

$$\text{So, } 2^x = \frac{7}{32}$$

$$2^x = \frac{7}{32} \text{ or } y = \frac{7}{32} \text{ or awrt } 0.219$$

A1 oe
dM1

$$x \log 2 = \log\left(\frac{7}{32}\right) \text{ or } x = \frac{\log\left(\frac{7}{32}\right)}{\log 2} \text{ or } x = \log_2\left(\frac{7}{32}\right)$$

A valid method for solving $2^x = \frac{7}{32}$
Or $2^x = k$ to achieve $x = \dots$

$$x = -2.192645\dots$$

awrt -2.19 | A1

Question 5

$$y = \frac{1}{16} \text{ or } y = 81$$

$$\text{Let } y^{\frac{1}{4}} = x$$

$$2x^2 - 7x + 3 = 0$$

$$(2x-1)(x-3) = 0$$

$$x = \frac{1}{2}, x = 3$$

$$y = \left(\frac{1}{2}\right)^4, y = 3^4$$

$$y = \frac{1}{16}, y = 81$$

M1*

M1dep*

A1

M1dep*

A1

Question 6

$$y = \frac{5}{3}x - 4$$

(b) Gradient of perp. line = $\frac{-1}{(-\frac{3}{5})}$ (Using $-\frac{1}{m}$ with the m from part (a))

$$y - 1 = \left(\frac{5}{3}\right)(x - 3)$$

$$y = \frac{5}{3}x - 4 \quad (\text{Must be in this form... allow } y = \frac{5}{3}x - \frac{12}{3} \text{ but not } y = \frac{5x - 12}{3})$$

M1
M1
A1

(3)

Question 7

$$V = 28 \text{ m s}^{-1}$$

(c)	$120 + \frac{1}{2}(V+5)16 + 22V = 1000$ $\text{Solve: } 30V = 840 \Rightarrow V = \underline{28}$	M1 B1 A1 DM1 A1 (5)
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Question 8

(a)

$$a = \frac{4}{3}$$

eg $8 = -4 + 9a$

$$a = \frac{4}{3} \text{ (ms}^{-2}\text{)}$$

M1	3.4	Use of $v = u + at$ with their u or $s = vt - \frac{1}{2}at^2$ or $v^2 = u^2 + 2as$ with their u or $s = ut + \frac{1}{2}at^2$ with their u
A1	1.1	Accept 1.33 or better

(b)

$$20.7 \text{ ms}^{-1} \text{ (1 mark)}$$

(c)

$$2 \text{ seconds (1 mark)}$$