Edexcel - Pure Year 2 exam questions

Arancha Ruiz

June 2023 Question 12 Paper 2

12.

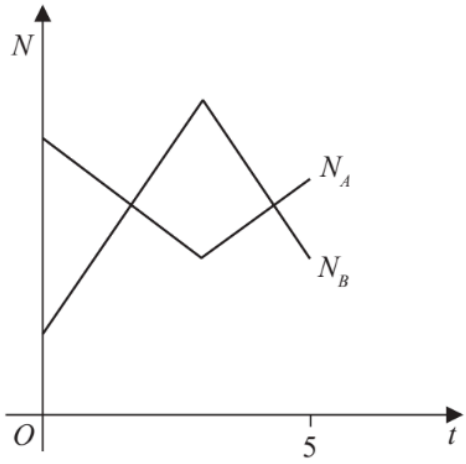


Figure 2

The number of subscribers to two different music streaming companies is being monitored.

The number of subscribers, N_A, in thousands, to **company A** is modelled by the equation

$$N_A = |t - 3| + 4 \qquad t \geqslant 0$$

where t is the time in years since monitoring began.

The number of subscribers, N_B, in thousands, to **company B** is modelled by the equation

$$N_B = 8 - |2t - 6| \qquad t \geqslant 0$$

where t is the time in years since monitoring began.

Figure 2 shows a sketch of the graph of N_A and the graph of N_B over a 5-year period.

Use the equations of the models to answer parts (a), (b), (c) and (d).

(a) Find the initial difference between the number of subscribers to **company A** and the number of subscribers to **company B**.

(2)

When $t = T$ **company A** reduced its subscription prices and the number of subscribers increased.

(b) Suggest a value for T, giving a reason for your answer.

(2)

(c) Find the range of values of t for which $N_A > N_B$ giving your answer in set notation.
(5)

(d) State a limitation of the model used for **company B**.
(1)

ANSWER

Question	Scheme	Marks	AOs
12(a)	$N_A - N_B = (3+4)-(8-6) = \ldots$	**M1**	3.4
	5000 (subscribers)	**A1**	3.2a
		(2)	
(b)	$(T=)3$	**B1**	3.4
	This was the point when company A had the lowest number of subscribers	**B1**	2.4
		(2)	
(c)			
	$-t+7=2t+2$ o.e. or $t+1=14-2t$ o.e.	**B1**	3.1a
	$-t+7=2t+2$ o.e. $\Rightarrow t=\ldots$ or $t+1=14-2t$ o.e. $\Rightarrow t=\ldots$	**M1**	3.4
	One of the two critical values $t=\frac{5}{3}$ or $t=\frac{13}{3}$	**A1**	1.1b
	Chooses the outside region for their **two** values of t Both of $t<"\frac{5}{3}"$, $t>"\frac{13}{3}"$	**A1ft**	2.2a
	$\left\{t\in\mathbb{R}: t<\frac{5}{3}\right\}\cup\left\{t\in\mathbb{R}: t>\frac{13}{3}\right\}$	**A1**	2.5
		(5)	
(d)	The number of subscribers will become negative (when $t>7$)	**B1**	3.5b
		(1)	
		(10 marks)	

June 2023 Question 7 Paper 1

7. The function f is defined by

$$f(x) = 3 + \sqrt{x - 2} \qquad x \in \mathbb{R} \quad x > 2$$

(a) State the range of f

(1)

(b) Find f^{-1}

(3)

The function g is defined by

$$g(x) = \frac{15}{x - 3} \qquad x \in \mathbb{R} \quad x \neq 3$$

(c) Find gf(6)

(2)

ANSWER

Question	Scheme	Marks	AOs
7(a)	$f(x) > 3$	B1	1.1b
		(1)	
(b)	$y = 3 + \sqrt{x-2} \Rightarrow x = ...$	M1	1.1b
	$f^{-1}(x) = (x-3)^2 + 2$	A1	1.1b
	$x > 3$	B1ft	2.2a
		(3)	
(c)	$f(6) = 3 + \sqrt{6-2} = 5 \Rightarrow g("5") = \frac{15}{"5"-3} = ...$	M1	1.1b
	$= \frac{15}{2}$	A1	1.1b
		(2)	
(d)	$3 + \sqrt{a^2 + 2 - 2} = \frac{15}{a-3} \Rightarrow "a^2 - 9 = 15"$	M1	1.1b
	$a = 2\sqrt{6}$	A1	2.2a
		(2)	
			(8 marks)

June 2022 Question 10 Paper 2

10. The function f is defined by

$$f(x) = \frac{8x+5}{2x+3} \qquad x > -\frac{3}{2}$$

(a) Find $f^{-1}\left(\frac{3}{2}\right)$

(2)

(b) Show that

$$f(x) = A + \frac{B}{2x+3}$$

where A and B are constants to be found.

(2)

The function g is defined by

$$g(x) = 16 - x^2 \qquad 0 \leqslant x \leqslant 4$$

(c) State the range of g^{-1}

(1)

(d) Find the range of fg^{-1}

(3)

ANSWER

Question	Scheme	Marks	AOs
10(a)	Attempts to solve $\frac{3}{2}=\frac{8x+5}{2x+3}\Rightarrow x=\ldots$ Or substitutes $x=\frac{3}{2}$ into $\frac{5-3x}{2x-8}$	M1	3.1a
	$\left(f^{-1}\left(\frac{3}{2}\right)=\right)-\frac{1}{10}$	A1	1.1b
		(2)	
(b)	$\left(\frac{8x+5}{2x+3}=\right)4\pm\frac{\ldots}{2x+3}$	M1	1.1b
	$\left(\frac{8x+5}{2x+3}=\right)4-\frac{7}{2x+3}$	A1	2.1
		(2)	
(c)	$0\leqslant g^{-1}(x)\leqslant 4$	B1	2.2a
		(1)	
(d)	Attempts either boundary $f(0)=\frac{8\times0+5}{2\times0+3}$ **or** $f(4)=\frac{8\times4+5}{2\times4+3}$	M1	3.1a
	Attempts both boundaries $f(0)=\frac{8\times0+5}{2\times0+3}$ **and** $f(4)=\frac{8\times4+5}{2\times4+3}$	dM1	1.1b
	Range $\frac{5}{3}\leqslant fg^{-1}(x)\leqslant\frac{37}{11}$	A1	2.1
		(3)	

Video solution:

https://youtu.be/EhjZKTGzTwM

June 2022 Question 1 Paper 2

1. **In this question you must show all stages of your working.**

Solutions relying entirely on calculator technology are not acceptable.

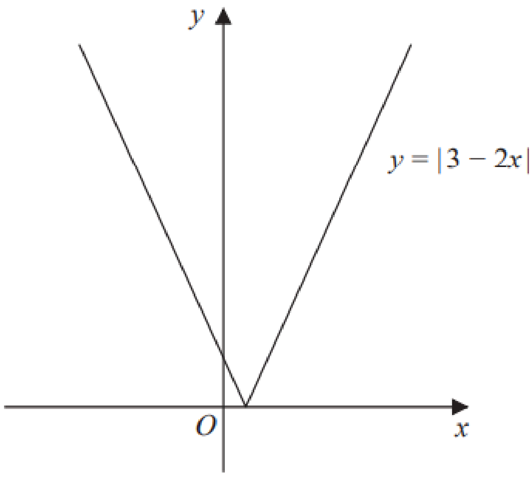


Figure 1

Figure 1 shows a sketch of the graph with equation $y = |3 - 2x|$

Solve

$$|3 - 2x| = 7 + x$$

(4)

ANSWER

Question	Scheme	Marks	AOs
1	For an attempt to solve **Either** $3-2x=7+x \Rightarrow x=\ldots$ **or** $2x-3=7+x \Rightarrow x=\ldots$	M1	1.1b
	Either $x=-\frac{4}{3}$ **or** $x=10$	A1	1.1b
	For an attempt to solve **Both** $3-2x=7+x \Rightarrow x=\ldots$ **and** $2x-3=7+x \Rightarrow x=\ldots$	dM1	1.1b
	For **both** $x=-\frac{4}{3}$ **and** $x=10$ with no extra solutions	A1	1.1b
		(4)	

June 2022 Question 1 Paper 1

1. The point $P(-2, -5)$ lies on the curve with equation $y = f(x), \quad x \in \mathbb{R}$

Find the point to which P is mapped, when the curve with equation $y = f(x)$ is transformed to the curve with equation

(a) $y = f(x) + 2$ **(1)**

(b) $y = |f(x)|$ **(1)**

(c) $y = 3f(x - 2) + 2$ **(2)**

ANSWER

Question	Scheme	Marks	AOs
1 (a)	$(-2, -3)$	B1	1.1b
		(1)	
(b)	$(-2, 5)$	B1	1.1b
		(1)	
(c)	Either $x = 0$ or $y = -13$	M1	1.1b
	$(0, -13)$	A1	1.1b
		(2)	
			(4 marks)
Notes:			

November 2021 Question 2 Paper 1

2. Given that

$$f(x) = x^2 - 4x + 5 \qquad x \in \mathbb{R}$$

(a) express f(x) in the form $(x + a)^2 + b$ where a and b are integers to be found.

(2)

The curve with equation $y = f(x)$

- meets the y-axis at the point P
- has a minimum turning point at the point Q

(b) Write down

(i) the coordinates of P

(ii) the coordinates of Q

(2)

ANSWER

Question	Scheme	Marks	AOs
2(a)	$f(x) = (x-2)^2 \pm ...$	M1	1.2
	$f(x) = (x-2)^2 + 1$	A1	1.1b
		(2)	
(b)(i)	$P = (0, 5)$	B1	1.1b
(b)(ii)	$Q = (2, 1)$	B1ft	1.1b
		(2)	
			(4 marks)

November 2021 Question 2 Paper 2

2. The functions f and g are defined by

$$f(x) = 7 - 2x^2 \qquad x \in \mathbb{R}$$

$$g(x) = \frac{3x}{5x-1} \qquad x \in \mathbb{R} \qquad x \neq \frac{1}{5}$$

(a) State the range of f

(1)

(b) Find gf(1.8)

(2)

(c) Find $g^{-1}(x)$

(2)

ANSWER

Question	Scheme	Marks	AOs
2(a)	$y \leqslant 7$	B1	2.5
		(1)	
(b)	$f(1.8) = 7 - 2\times1.8^2 = 0.52 \Rightarrow gf(1.8) = g(0.52) = \dfrac{3\times0.52}{5\times0.52-1} = ...$	M1	1.1b
	$gf(1.8) = 0.975$ oe e.g. $\dfrac{39}{40}$	A1	1.1b
		(2)	
(c)	$y = \dfrac{3x}{5x-1} \Rightarrow 5xy - y = 3x \Rightarrow x(5y-3) = y$	M1	1.1b
	$\left(g^{-1}(x) =\right)\dfrac{x}{5x-3}$	A1	2.2a
		(2)	
			(5 marks)

Arancha Ruiz

November 2021 Question 11 Paper 2

11.

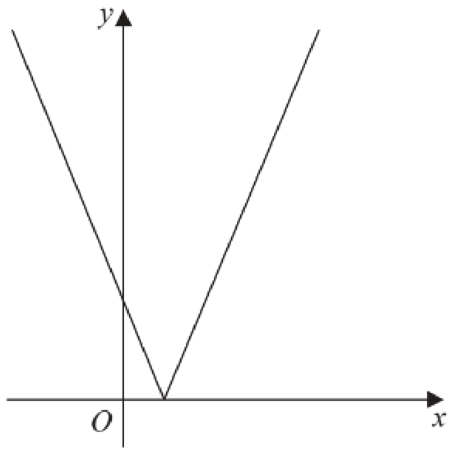


Figure 4

Figure 4 shows a sketch of the graph with equation

$$y = |2x - 3k|$$

where k is a positive constant.

(a) Sketch the graph with equation $y = \mathrm{f}(x)$ where

$$\mathrm{f}(x) = k - |2x - 3k|$$

stating

- the coordinates of the maximum point
- the coordinates of any points where the graph cuts the coordinate axes

(4)

(b) Find, in terms of k, the set of values of x for which

$$k - |2x - 3k| > x - k$$

giving your answer in set notation.

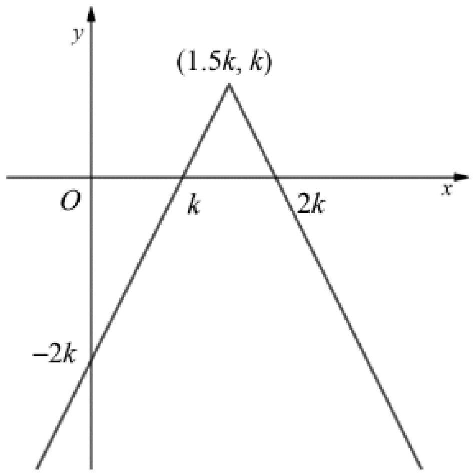
(4)

(c) Find, in terms of k, the coordinates of the minimum point of the graph with equation

$$y = 3 - 5\mathrm{f}\left(\frac{1}{2}x\right)$$

(2)

ANSWER

Question	Scheme	Marks	AOs
11(a)			
	$\wedge$ shape in any position	B1	1.1b
	Correct x-intercepts or coordinates	B1	1.1b
	Correct y-intercept or coordinates	B1	1.1b
	Correct coordinates for the vertex of a $\wedge$ shape	B1	1.1b
		(4)	
(b)	$x=k$	B1	2.2a
	$k-(2x-3k)=x-k \Rightarrow x=\ldots$	M1	3.1a
	$x=\frac{5k}{3}$	A1	1.1b
	Set notation is required here for this mark $\left\{x : x<\frac{5k}{3}\right\} \cap \{x : x>k\}$	A1	2.5
		(4)	
(c)	$x=3k$ **or** $y=3-5k$	B1ft	2.2a
	$x=3k$ **and** $y=3-5k$	B1ft	2.2a
		(2)	
			(10 marks)

Video solution:

https://youtu.be/1jKajcJ28-8

November 2020 Question 4 Paper 1

4. The function f is defined by

$$f(x) = \frac{3x-7}{x-2} \qquad x \in \mathbb{R}, x \neq 2$$

(a) Find $f^{-1}(7)$

(2)

(b) Show that $ff(x) = \frac{ax+b}{x-3}$ where a and b are integers to be found.

(3)

ANSWER

Question	Scheme	Marks	AOs
4 (a)	Either attempts $\frac{3x-7}{x-2} = 7 \Rightarrow x = \ldots$ Or attempts $f^{-1}(x)$ and substitutes in $x = 7$	M1	3.1a
	$\frac{7}{4}$ oe	A1	1.1b
		(2)	
(b)	Attempts $ff(x) = \dfrac{3 \times \left(\frac{3x-7}{x-2}\right) - 7}{\left(\frac{3x-7}{x-2}\right) - 2} = \dfrac{3 \times (3x-7) - 7(x-2)}{3x-7-2(x-2)}$	M1, dM1	1.1b 1.1b
	$= \dfrac{2x-7}{x-3}$	A1	2.1
		(3)	
			(5 marks)

November 2020 Question 11 Paper 2

11.

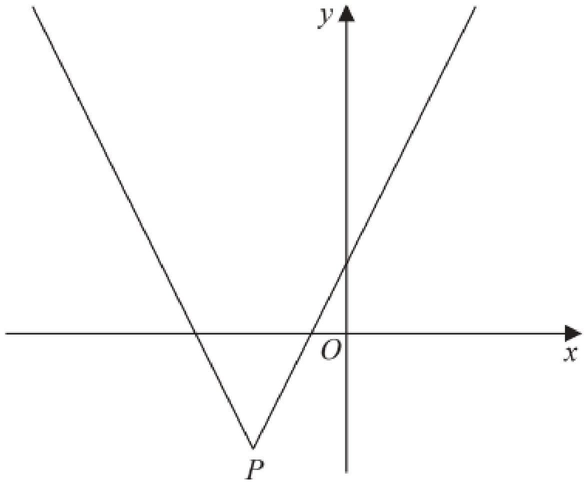


Figure 2

Figure 2 shows a sketch of the graph with equation

$$y = 2|x + 4| - 5$$

The vertex of the graph is at the point P, shown in Figure 2.

(a) Find the coordinates of P.

(2)

(b) Solve the equation

$$3x + 40 = 2|x + 4| - 5$$

(2)

A line l has equation $y = ax$, where a is a constant.

Given that l intersects $y = 2|x + 4| - 5$ at least once,

(c) find the range of possible values of a, writing your answer in set notation.

(3)

ANSWER

Question	Scheme	Marks	AOs
11(a)	$x=-4$ **or** $y=-5$	B1	1.1b
	$P(-4,-5)$	B1	2.2a
		(2)	
(b)	$3x+40=-2(x+4)-5 \Rightarrow x=...$	M1	1.1b
	$x=-10.6$	A1	2.1
		(2)	
(c)	$a>2$	B1	2.2a
	$y=ax \Rightarrow -5=-4a \Rightarrow a=\frac{5}{4}$	M1	3.1a
	$\{a: a \leqslant 1.25\} \cup \{a: a>2\}$	A1	2.5
		(3)	
			(7 marks)

Video solution:

https://youtu.be/6hXXcBz7V7w

June 2019 Question 5 Paper 1

5. $$f(x) = 2x^2 + 4x + 9 \qquad x \in \mathbb{R}$$

(a) Write $f(x)$ in the form $a(x + b)^2 + c$, where a, b and c are integers to be found.

(3)

(b) Sketch the curve with equation $y = f(x)$ showing any points of intersection with the coordinate axes and the coordinates of any turning point.

(3)

(c) (i) Describe fully the transformation that maps the curve with equation $y = f(x)$ onto the curve with equation $y = g(x)$ where

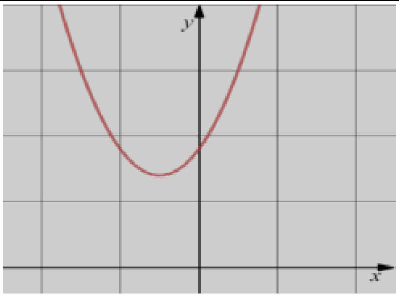
$$g(x) = 2(x - 2)^2 + 4x - 3 \qquad x \in \mathbb{R}$$

(ii) Find the range of the function

$$h(x) = \frac{21}{2x^2 + 4x + 9} \qquad x \in \mathbb{R}$$

(4)

ANSWER

5 (a)	$2x^2+4x+9=2(x\pm k)^2\pm....$ $\quad a=2$	B1	1.1b
	Full method $2x^2+4x+9=2(x+1)^2\pm...$ $\quad a=2\ \&\ b=1$	M1	1.1b
	$2x^2+4x+9=2(x+1)^2+7$	A1	1.1b
		(3)	
(b)	 U shaped curve any position but not through (0,0)	B1	1.2
	y - intercept at $(0,9)$	B1	1.1b
	Minimum at $(-1,7)$	B1ft	2.2a
		(3)	
(c)	(i) Deduces translation with one correct aspect.	M1	3.1a
	Translate $\begin{pmatrix}2\\-4\end{pmatrix}$	A1	2.2a
	(ii) $\mathrm{h}(x)=\dfrac{21}{"2(x+1)^2+7"}\Rightarrow$ (maximum) value $\dfrac{21}{"7"}(=3)$	M1	3.1a
	$0<\mathrm{h}(x)\leqslant 3$	A1ft	1.1b
		(4)	
			(10 marks)

Arancha Ruiz

June 2019 Question 6 Paper 2

6.

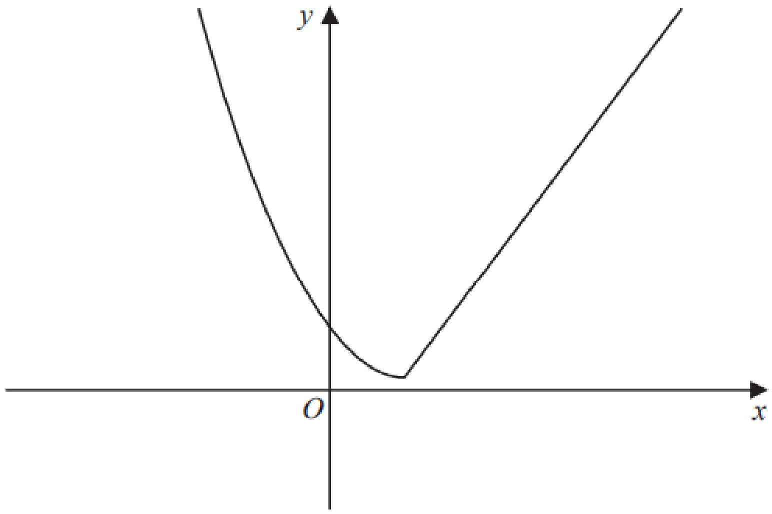


Figure 4

Figure 4 shows a sketch of the graph of $y = \mathrm{g}(x)$, where

$$\mathrm{g}(x) = \begin{cases} (x-2)^2 + 1 & x \leqslant 2 \\ 4x - 7 & x > 2 \end{cases}$$

(a) Find the value of $\mathrm{gg}(0)$.

(2)

(b) Find all values of x for which

$$\mathrm{g}(x) > 28$$

(4)

The function h is defined by

$$\mathrm{h}(x) = (x-2)^2 + 1 \qquad x \leqslant 2$$

(c) Explain why h has an inverse but g does not.

(1)

(d) Solve the equation

$$\mathrm{h}^{-1}(x) = -\frac{1}{2}$$

(3)

ANSWER

Question	Scheme	Marks	AOs
6 (a)	$gg(0) = g((0-2)^2+1) = g(5) = 4(5)-7 = 13$	M1	2.1
		A1	1.1b
		(2)	
(b)	Solves either $(x-2)^2+1=28 \Rightarrow x=...$ or $4x-7=28 \Rightarrow x=...$	M1	1.1b
	At least one critical value $x=2-3\sqrt{3}$ or $x=\frac{35}{4}$ is correct	A1	1.1b
	Solves both $(x-2)^2+1=28 \Rightarrow x=...$ and $4x-7=28 \Rightarrow x=...$	M1	1.1b
	Correct final answer of '$x<2-3\sqrt{3}$, $x>\frac{35}{4}$'	A1	2.1
	Note: Writing awrt -3.20 or a truncated -3.19 or a truncated -3.2 in place of $2-3\sqrt{3}$ is accepted for any of the A marks	(4)	
(c)	<u>h is a one-one</u> {function (or mapping) so has an inverse} <u>g is a many-one</u> {function (or mapping) so does not have an inverse}	B1	2.4
		(1)	
(d) Way 1	$\left\{h^{-1}(x) = -\frac{1}{2} \Rightarrow\right\}$ $x = h\left(-\frac{1}{2}\right)$	M1 B1 on epen	1.1b
	$x = \left(-\frac{1}{2}-2\right)^2+1$ **Note:** Condone $x = \left(\frac{1}{2}-2\right)^2+1$	M1	1.1b
	$\Rightarrow x = 7.25$ only **cso**	A1	2.2a
		(3)	
(d) Way 2	{their $h^{-1}(x)$ } $= \pm 2 \pm \sqrt{x \pm 1}$	M1	1.1b
	Attempts to solve $\pm 2 \pm \sqrt{x \pm 1} = -\frac{1}{2} \Rightarrow \pm\sqrt{x \pm 1} = ...$	M1	1.1b
	$\Rightarrow x = 7.25$ only **cso**	A1	2.2a
		(3)	
		(10 marks)	

June 2018 Question 1 Paper 2

1.

$$g(x) = \frac{2x+5}{x-3} \qquad x \geqslant 5$$

(a) Find gg(5).

(2)

(b) State the range of g.

(1)

(c) Find $g^{-1}(x)$, stating its domain.

(3)

ANSWER

Question	Scheme	Marks	AOs
1	$\mathrm{g}(x)=\dfrac{2x+5}{x-3},\ x\ge 5$		
(a) **Way 1**	$\mathrm{g}(5)=\dfrac{2(5)+5}{5-3}=7.5 \Rightarrow \mathrm{gg}(5)=\dfrac{2(\text{"}7.5\text{"})+5}{\text{"}7.5\text{"}-3}$	M1	1.1b
	$\mathrm{gg}(5)=\dfrac{40}{9}\ \left(\text{or } 4\dfrac{4}{9} \text{ or } 4.\dot{4}\right)$	A1	1.1b
		(2)	
(a) **Way 2**	$\mathrm{gg}(x)=\dfrac{2\left(\dfrac{2x+5}{x-3}\right)+5}{\left(\dfrac{2x+5}{x-3}\right)-3} \Rightarrow \mathrm{gg}(5)=\dfrac{2\left(\dfrac{2(5)+5}{(5)-3}\right)+5}{\left(\dfrac{2(5)+5}{(5)-3}\right)-3}$	M1	1.1b
	$\mathrm{gg}(5)=\dfrac{40}{9}\ \left(\text{or } 4\dfrac{4}{9} \text{ or } 4.\dot{4}\right)$	A1	1.1b
		(2)	
(b)	$\{\text{Range:}\}\ \ 2<y\le \dfrac{15}{2}$	B1	1.1b
		(1)	
(c) **Way 1**	$y=\dfrac{2x+5}{x-3} \Rightarrow\ yx-3y=2x+5 \Rightarrow yx-2x=3y+5$	M1	1.1b
	$x(y-2)=3y+5 \Rightarrow\ x=\dfrac{3y+5}{y-2}\ \ \left\{\text{or }\ y=\dfrac{3x+5}{x-2}\right\}$	M1	2.1
	$\mathrm{g}^{-1}(x)=\dfrac{3x+5}{x-2},\quad 2<x\le\dfrac{15}{2}$	A1ft	2.5
		(3)	
(c) **Way 2**	$y=\dfrac{2x-6+11}{x-3} \Rightarrow\ y=2+\dfrac{11}{x-3} \Rightarrow y-2=\dfrac{11}{x-3}$	M1	1.1b
	$x-3=\dfrac{11}{y-2} \Rightarrow x=\dfrac{11}{y-2}+3\ \ \left\{\text{or }\ y=\dfrac{11}{x-2}+3\right\}$	M1	2.1
	$\mathrm{g}^{-1}(x)=\dfrac{11}{x-2}+3,\quad 2<x\le\dfrac{15}{2}$	A1ft	2.5
		(3)	
			(6 marks)

June 2018 Question 3 Paper 2

3. (a) "If m and n are irrational numbers, where $m \neq n$, then mn is also irrational."

Disprove this statement by means of a counter example.

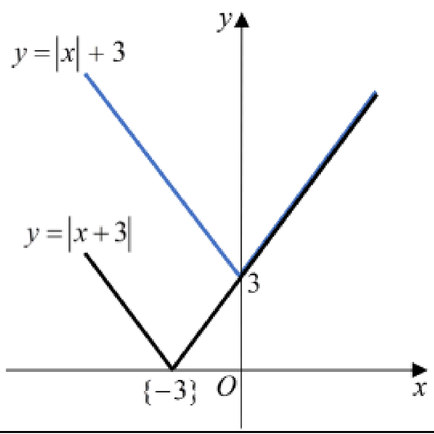
(2)

(b) (i) Sketch the graph of $y = |x| + 3$

(ii) Explain why $|x| + 3 \geqslant |x + 3|$ for all real values of x.

(3)

ANSWER

Question	Scheme	Marks	AOs
3	Statement: "If m and n are irrational numbers, where $m \neq n$, then mn is also irrational."		
(a)	E.g. $m = \sqrt{3},\ n = \sqrt{12}$	M1	1.1b
	$\{mn =\}\ \left(\sqrt{3}\right)\left(\sqrt{12}\right) = 6$ $\Rightarrow$ statement untrue **or** 6 is not irrational or 6 is rational	A1	2.4
		(2)	
(b)(i), (ii) Way 1	 V shaped graph {reasonably} symmetrical about the y-axis with vertical interpret $(0, 3)$ or 3 stated or marked on the positive y-axis	B1	1.1b
	Superimposes the graph of $y = \lvert x+3 \rvert$ on top of the graph of $y = \lvert x \rvert + 3$	M1	3.1a
	the graph of $y = \lvert x \rvert + 3$ is either the same or above the graph of $y = \lvert x+3 \rvert$ {for corresponding values of x} **or** when $x \geq 0$, both graphs are equal (or the same) when $x < 0$, the graph of $y = \lvert x \rvert + 3$ is above the graph of $y = \lvert x+3 \rvert$	A1	2.4
		(3)	

Question	Scheme		Marks	AOs
(b)(ii) Way 2	**<u>Reason 1</u>** When $x \geq 0$, $\lvert x \rvert + 3 = \lvert x+3 \rvert$	Any one of Reason 1 or Reason 2	M1	3.1a
	<u>Reason 2</u> When $x < 0$, $\lvert x \rvert + 3 > \lvert x+3 \rvert$	Both Reason 1 and Reason 2	A1	2.4
				(5 marks)

June 2018 Question 6 Paper 2

6.

$$f(x) = -3x^3 + 8x^2 - 9x + 10, \quad x \in \mathbb{R}$$

(a) (i) Calculate f(2)

(ii) Write f(x) as a product of two algebraic factors.

(3)

Using the answer to (a)(ii),

(b) prove that there are exactly two real solutions to the equation

$$-3y^6 + 8y^4 - 9y^2 + 10 = 0$$

(2)

(c) deduce the number of real solutions, for $7\pi \leqslant \theta < 10\pi$, to the equation

$$3\tan^3\theta - 8\tan^2\theta + 9\tan\theta - 10 = 0$$

(1)

ANSWER

Question	Scheme	Marks	AOs
6	(a) $f(x) = -3x^3 + 8x^2 - 9x + 10, \quad x \in \mathbb{R}$		
(a)	(i) $\{f(2) = -24 + 32 - 18 + 10 \Rightarrow\}\ f(2) = 0$	B1	1.1b
	(ii) $\{f(x) =\}\ (x-2)(-3x^2 + 2x - 5)$ or $(2-x)(3x^2 - 2x + 5)$	M1 A1	2.2a 1.1b
		(3)	
(b)	$-3y^6 + 8y^4 - 9y^2 + 10 = 0 \Rightarrow (y^2 - 2)(-3y^4 + 2y^2 - 5) = 0$		
	Gives a partial explanation by • explaining that $-3y^4 + 2y^2 - 5 = 0$ has no {real} solutions with a reason, e.g. $b^2 - 4ac = (2)^2 - 4(-3)(-5) = -56 < 0$ • or stating that $y^2 = 2$ has 2 {real} solutions or $y = \pm\sqrt{2}$ {only}	M1	2.4
	Complete proof that the given equation has exactly two {real} solutions	A1	2.1
		(2)	
(c)	$3\tan^3\theta - 8\tan^2\theta + 9\tan\theta - 10 = 0;\ 7\pi \le \theta < 10\pi$		
	{Deduces that} there are 3 solutions	B1	2.2a
		(1)	
			(6 marks)