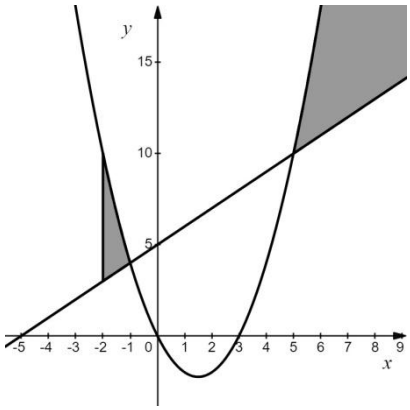
Question Number	Scheme	Marks
3 (i)	$z < 0$ or $z > \frac{1}{2}$	M1, A1 **(2)**
(ii)		
	Correctly draws $x = -2$	B1
	Correct left or right-hand region shaded	B1
	Correct left and right-hand region shaded	B1 **(3)**
		(5 marks)

(i)

M1: For an attempt, graphical, algebraic or otherwise that reaches either inequality.

Score for one of $z < 0, z > \frac{1}{2}$ Allow non-strict inequalities here. **No working is necessary**

Award even in cases where the solution(s) seem contradictory. E.g. $z > \frac{1}{2},\ z < \frac{1}{2}$

Condone an un-simplified version for this mark. E.g. $\frac{4}{z} < 8 \Rightarrow z > \frac{4}{8}$

Alternatively score for an attempt that proceeds to **both** critical values

A1: Correct answer which must be in simplest form.

Condone the appearance of a comma or the word "and" between the two inequalities

If set notation is used accept versions such as $\{z \in \mathbb{R} : z < 0\} \cup \left\{z \in \mathbb{R} : z > \frac{1}{2}\right\}$ but not with $\cap$

If they write $0 > z > \frac{1}{2}$ would score M1, A0

(ii)

Advice for examiners:

You may see the representation of the inequalities on Figure 1 and/or Diagram 1.

- If only Figure 1 is used mark Figure 1
- If both Figure 1 and Diagram 1 are used Diagram 1 takes precedence.

B1: Correctly draws the line with equation $x = -2$ (at least drawn between the line and curve)

Allow this line to be dotted.

Alternatively has $x = -2$ as the boundary of a shaded region (at least drawn between the line and curve)

Be tolerant of slips of the pen here or gaps in the boundary of the shaded region

B1: Shading implies a correct and distinct left-hand **OR** right-hand region shaded.

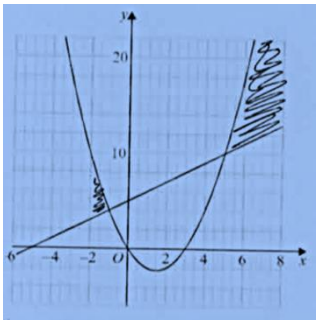
For the left-hand region, it is acceptable for the boundary line $x = -2$ to be 'dotted' or implied (by shading)

B1: Shading implies a correct and distinct left-hand and a correct and distinct right-hand region ONLY.

There must be an attempt to shade/include the whole of the left and right-hand region.

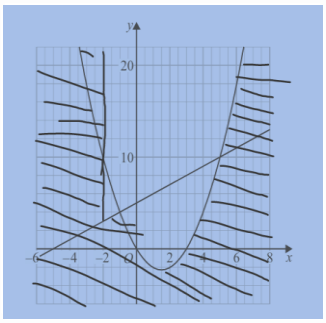
The line or the shading at the boundary at $x = -2$ must now be solid

Examples of how to apply the mark scheme;

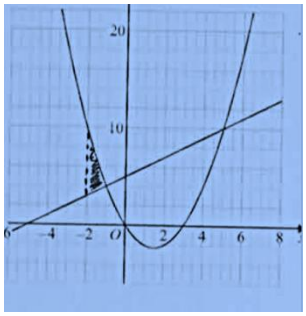


Award 1,1,0

B1: $x = -2$ is the boundary of a shaded region
B1: There is an acceptable attempt at shading either region.
Note that we could award this mark for either region
B0: There is not a solid line or completely shaded up to $x = -2$ boundary, so we have not got a fully correct diagram

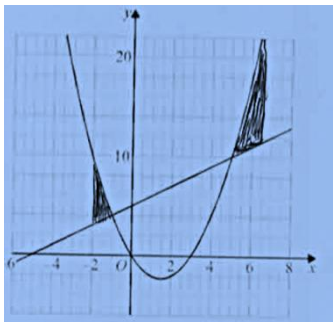


Award 1,0,0
B1: $x = -2$ is drawn (at least between the line and curve)
B0: No acceptable distinct region is indicated.
B0: Follows B0



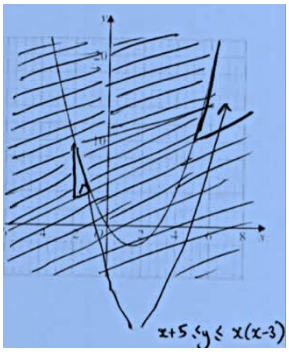
Award 1,1,0

B1: $x = -2$ drawn between the line and curve (accept dotted)
B1: There is an acceptable attempt at shading the left-hand region.
B0: There is no attempt to shade the right-hand region. Even if this right hand region had been shaded in, this mark would not be awarded due to the dotted line



award 1,1,0

B1: $x = -2$ is the boundary of a shaded region
B1: There is an acceptable attempt at shading the left-hand region.
B0: The shading on right-hand region is incomplete



Award 1,1,1
Candidates were not told to shade the required region so it is acceptable for them to indicate it in other ways as below
B1: $x = -2$ is drawn between the line and curve
B1: There is an acceptable attempt at indicating either region.
B1: There is an acceptable way of indicating the complete region

Alternatively, if they have drawn $x = -2$ with a solid line and write R in BOTH regions they can be awarded BOD 1,1,1

Question Number	Scheme	Marks
4 (a)	Grad $AB = \dfrac{8-2}{-1-7} = \left(-\dfrac{3}{4}\right)$	M1
	$y-2=-\dfrac{3}{4}(x-7) \Rightarrow 3x+4y-29=0$	dM1, A1
		(3)
(b)	Equation line L_2 $y-8=\dfrac{4}{3}(x+1)$	M1
	Substitutes $y=0$ $0-8=\dfrac{4}{3}(x+1) \Rightarrow x=-7$ So $(-7, 0)$	dM1, A1
		(3)
(c)	Attempts one required length. E.g. $AB^2=8^2+6^2 \Rightarrow AB=10$	M1
	Area $ABC = \dfrac{1}{2}AB \times AC = \dfrac{1}{2}10\times 10 = 50$	dM1, A1
		(3) **(9 marks)**

(a)

M1: Correct attempt at gradient.

It must be an attempt at $\dfrac{\Delta y}{\Delta x}$ with attempt at subtraction at least once

dM1: Correct attempt at equation of line L_1 using their found gradient and either of the points.

It is dependent upon the previous M mark. Look for an attempted application of $y-y_1 = "-\frac{3}{4}"(x-x_1)$.

You may well see $\dfrac{y-8}{x+1}=\dfrac{8-2}{-1-7}$ o.e. which would score M1, dM1

If they use the form $y=mx+c$ it must lead as far as c = …

A1: $3x+4y-29=0$ but accept any integer multiple of this. Accept terms in a different order

……

Alt (a)

M1: Attempts to substitute BOTH $A(-1, 8)$ and $B(7, 2)$ into $ax+by+c=0$ or $y=mx+c$

dM1: And solves using non calculator methods to find values of a, b and c or m and c.

The solution is not unique if using $ax+by+c=0$ so they may start by stating a value for c, e.g. $c = 2$

A1: $3x+4y-29=0$ but accept any integer multiple

……

(b)

M1: Uses the negative reciprocal of their gradient in (a) with $A(-1, 8)$ to form equation of L_2

dM1: Substitutes $y = 0$ in a correctly attempted L_2 and finds x = ...

It is dependent upon the previous M so L_2 must have been formed correctly

Condone slips where L_2 has been incorrectly adapted and $y = 0$ is substituted into this to find x.

A1: $(-7, 0)$ but condone $x=-7$ following substitution of $y = 0$

This is a non calculator question so this must follow M1, dM1

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