3

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-
-

Find the value of the following.

(i) $\left(\frac{1}{3}\right)^{-2}$ [2]

(ii) $16^{\frac{3}{4}}$ [2]

Simplify the following.

(i) a^0 [1]

(ii) $a^6 \div a^{-2}$ [1]

(iii) $(9a^6b^2)^{-\frac{1}{2}}$ [3]

Simplify the following.

(i) $\frac{16^{\frac{1}{2}}}{\ldots}$ [2]

[redacted]

Find the value of each of the following, giving each

[redacted]

(i) Find a, given that $a^3 = 64x^{12}y^3$. [2]

(ii) Find the value of $\left(\frac{1}{2}\right)^{-5}$. [2]

Indices Exam Questions Solutions

1. Jan 05 Q5

(i) $\left(\frac{1}{3}\right)^{-2} = \left(\frac{3}{1}\right)^{2} = 9$

(ii) $16^{3/4} = (16^{1/4})^{3} = 2^{3} = 8$

(iii) $(9a^{6}b^{2})^{-1/2} = \frac{1}{3}a^{-3}b^{-1}$ or $\frac{1}{3a^{3}b}$

2. Jan 05 Q6

(i) $a^{0} = 1$ (ii) $a^{6} \div a^{-2} = a^{8}$

June 06 Q4

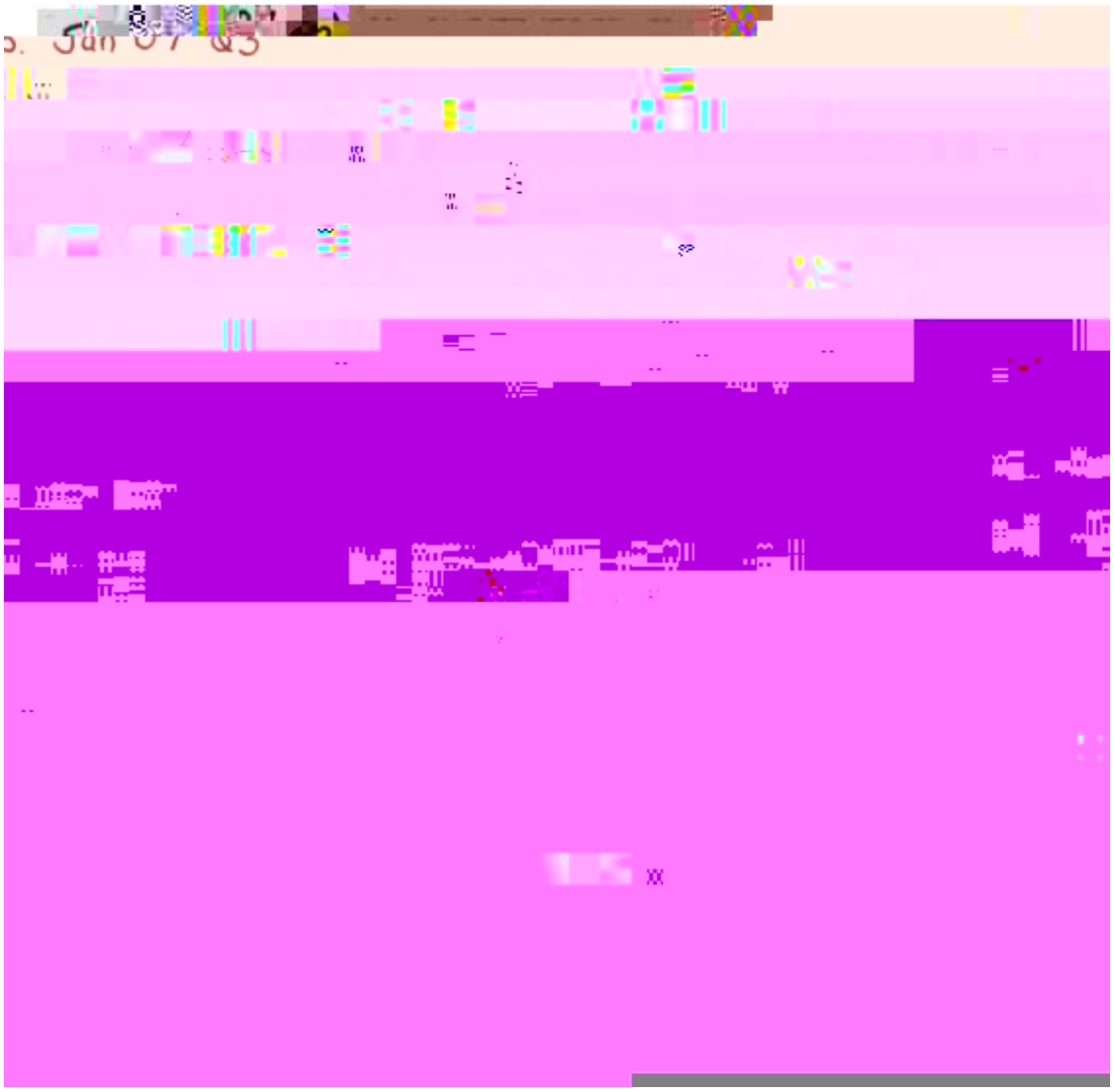
(i) $\frac{4}{a^{3}} = 3a^{10}b^{8}c^{-2}$ or $\frac{3a^{10}b^{8}}{c^{2}}$

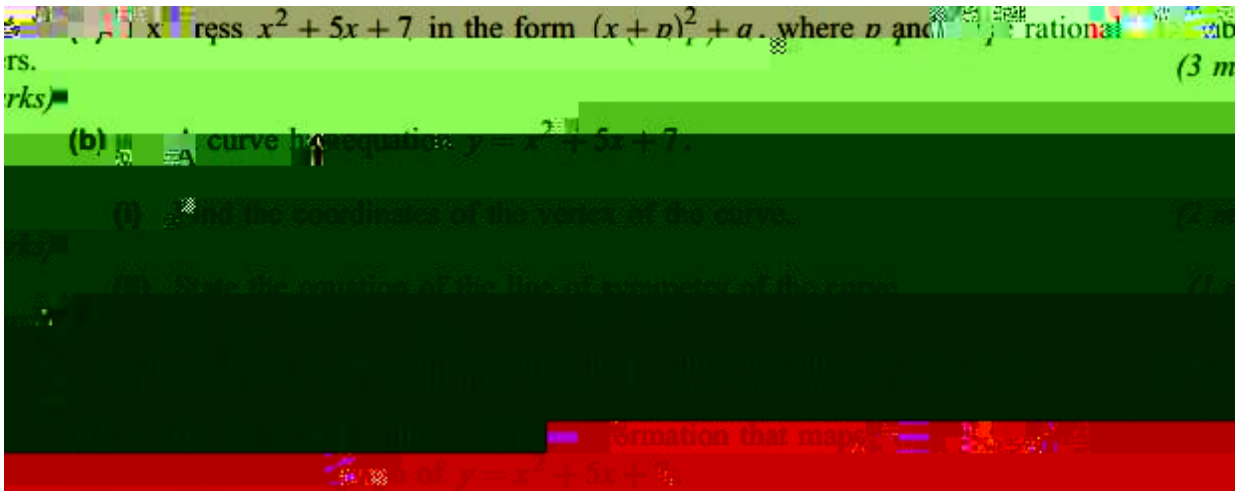
(ii) $\left(\frac{7}{3}\right)^{-2} = \left(\frac{3}{7}\right)^{2} = \frac{9}{49}$

+ Jan 07 Q6

(i) $25^{3/2} = (25^{1/2})^{3} = 5^{3} = 125$

$= \frac{4}{27}$





(a) Factorise $x^2 - 4x - 12$. *(1 mark)*

(b) Sketch the graph with equation $y = x^2 - 4x - 12$, stating the values where the curve crosses the coordinate axes. *(4 marks)*

(c) (i) Express $x^2 - 4x - 12$ in the form $(x - p)^2 - q$, where p and q are positive integers. *(2 marks)*

(ii) Hence find the minimum value of $x^2 - 4x - 12$. *(1 mark)*

The curve with equation $y = x^2$ [illegible]

real solutions. *(2 marks)*

(b) A curve has equation $y = x^2 - 6x + 11$.

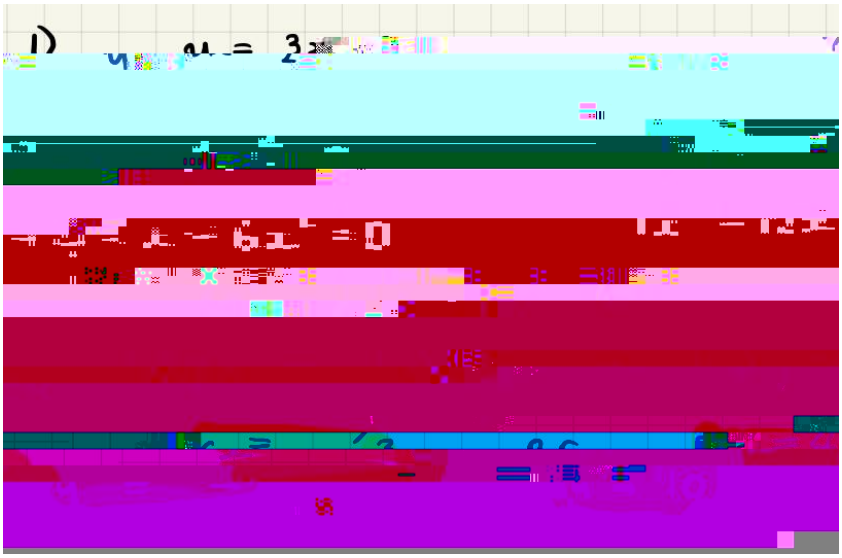
(i) Find the coordinates of the vertex of

$y = x^2 - 6x + 11$ onto the curve with equation $y = x^2$.

4 June 2 05

(ii) line of symmetry is $x = 3/2$ (B1ft)

$\equiv (x - 3/2)^2 - \frac{9}{4} + \frac{20}{4}$ (M1)



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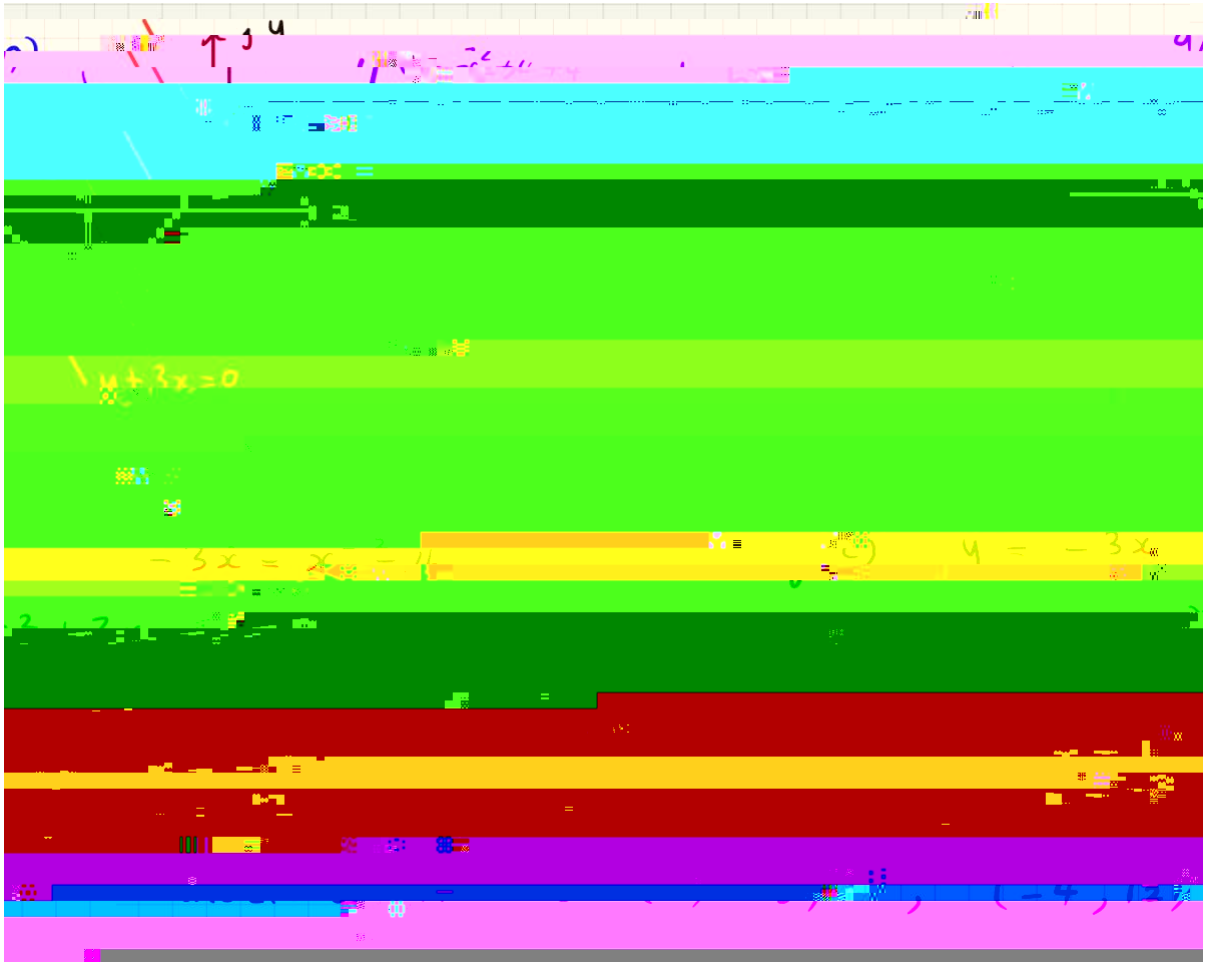
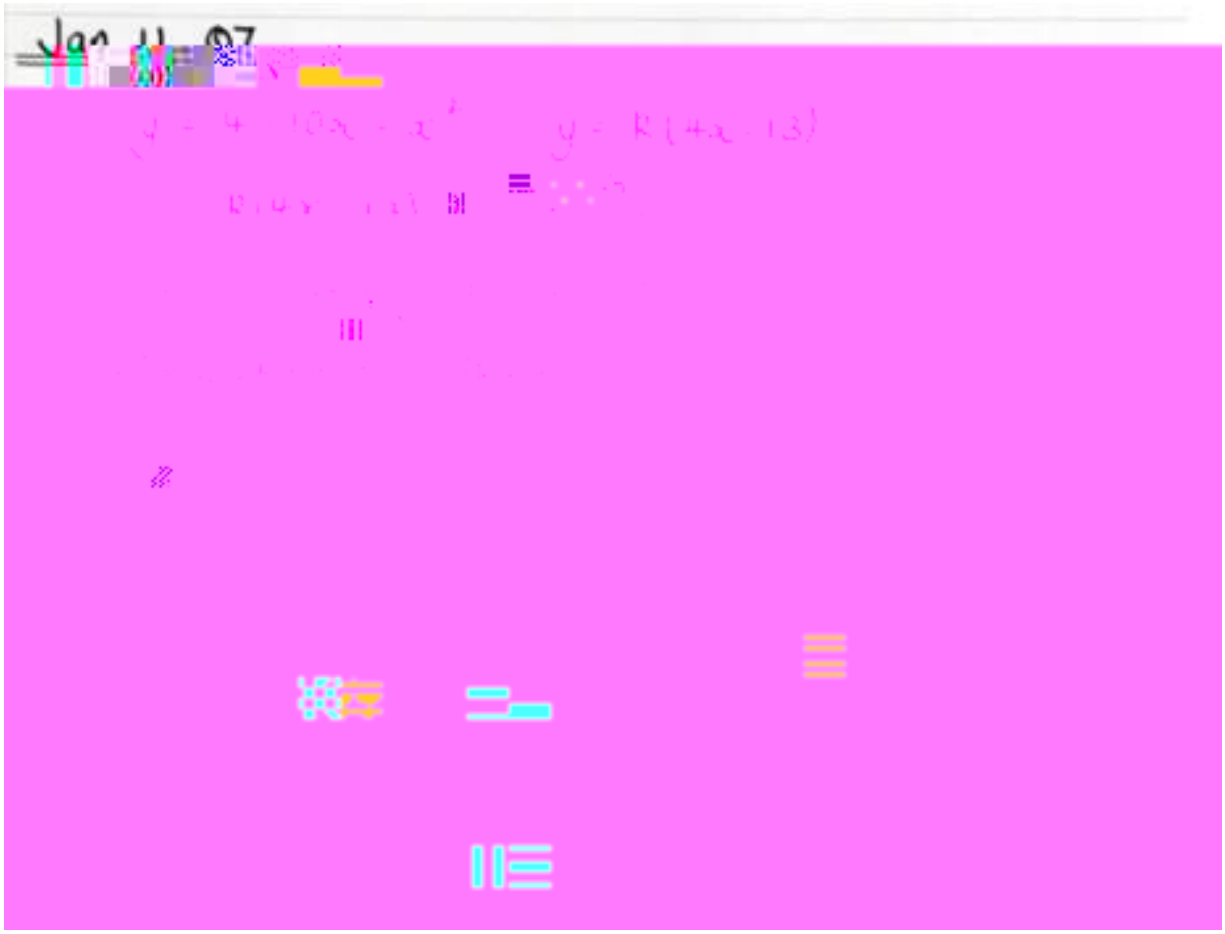




(iii) Solve the inequality $4k^2 + 33k + 29 > 0$. *(4 marks)*

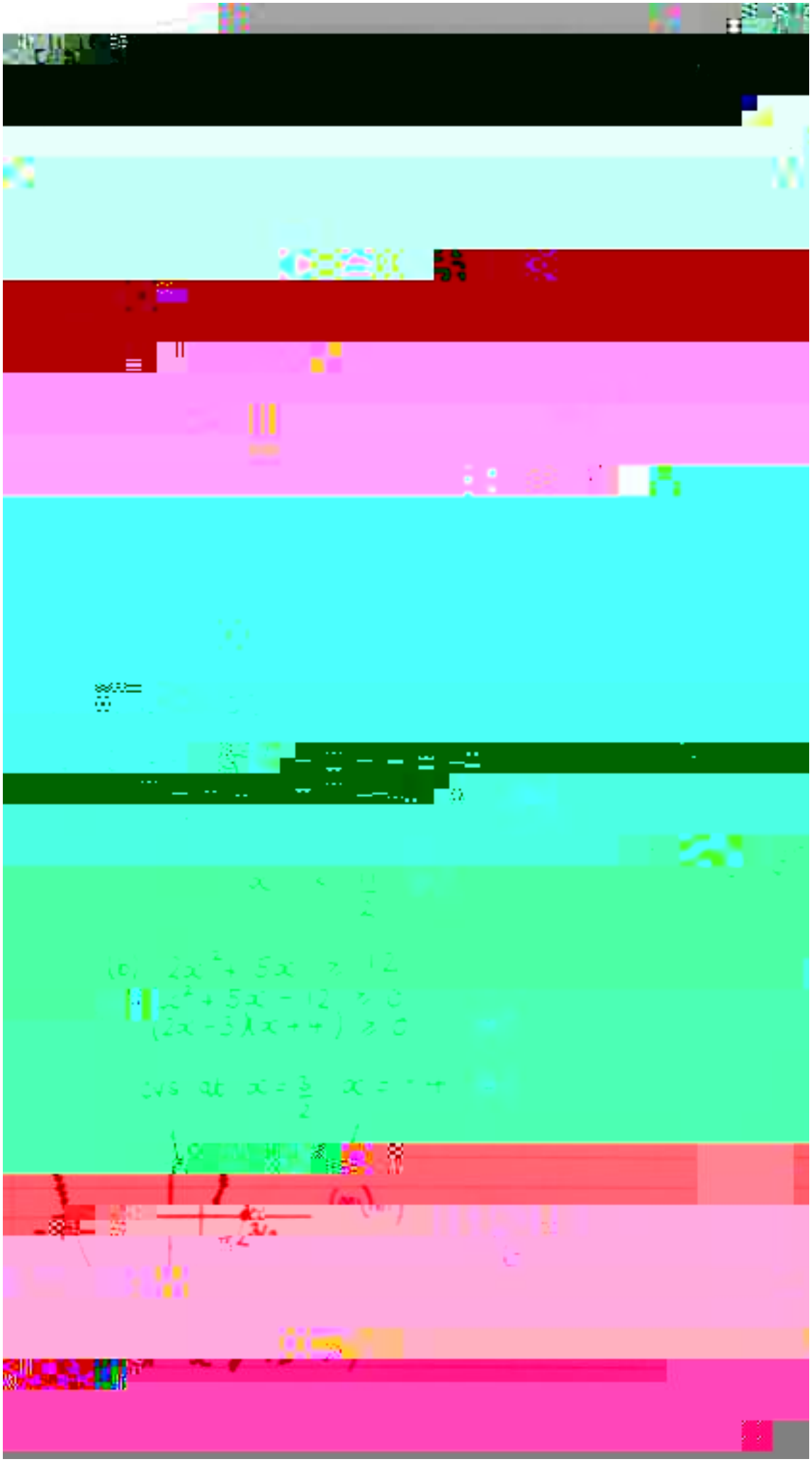
Solve each of the following inequalities.

(a) $2(4 - 3x) \geqslant 5 - x$, $x \in \mathbb{R}$. *(2 marks)*

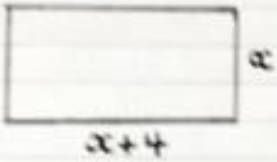
(b) $2x^2 + 5x \geqslant 12$. *(4 marks)*

A rectangular garden

(ii) Solve the inequality $3x^2 - 10x + 8 < 0$. *(4 marks)*



3 Jan 12 Q6



(a)

$x + x + x + \ldots > 30$

$4x + 8 > 30$

$4x > 22$

The diagram

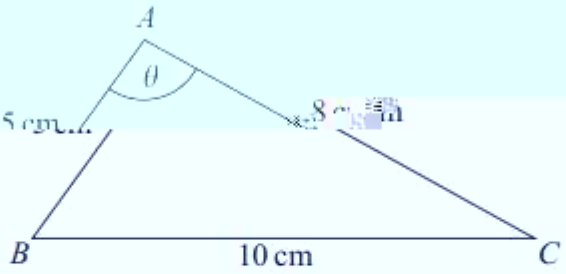
The triangle ABC, shown diagram, such that $BC = 6\,\text{cm}$, $AC = 5\,\text{cm}$ and $AB =$

(c) Hence find the area of the triangle ABC. *(2 marks)*

The diagram

The triangle

Find angle $BAC = \theta$.

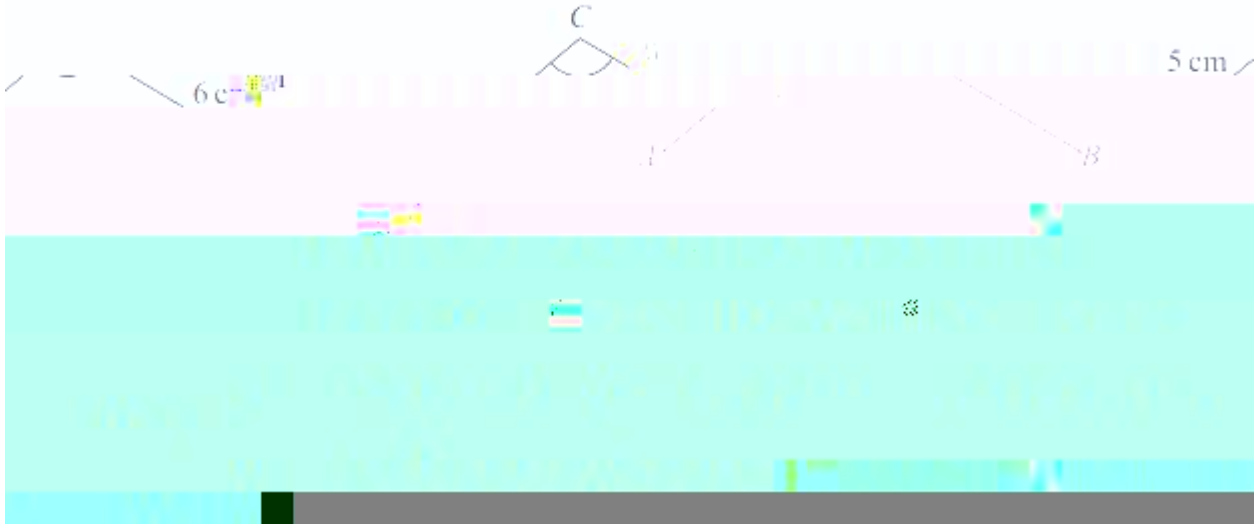


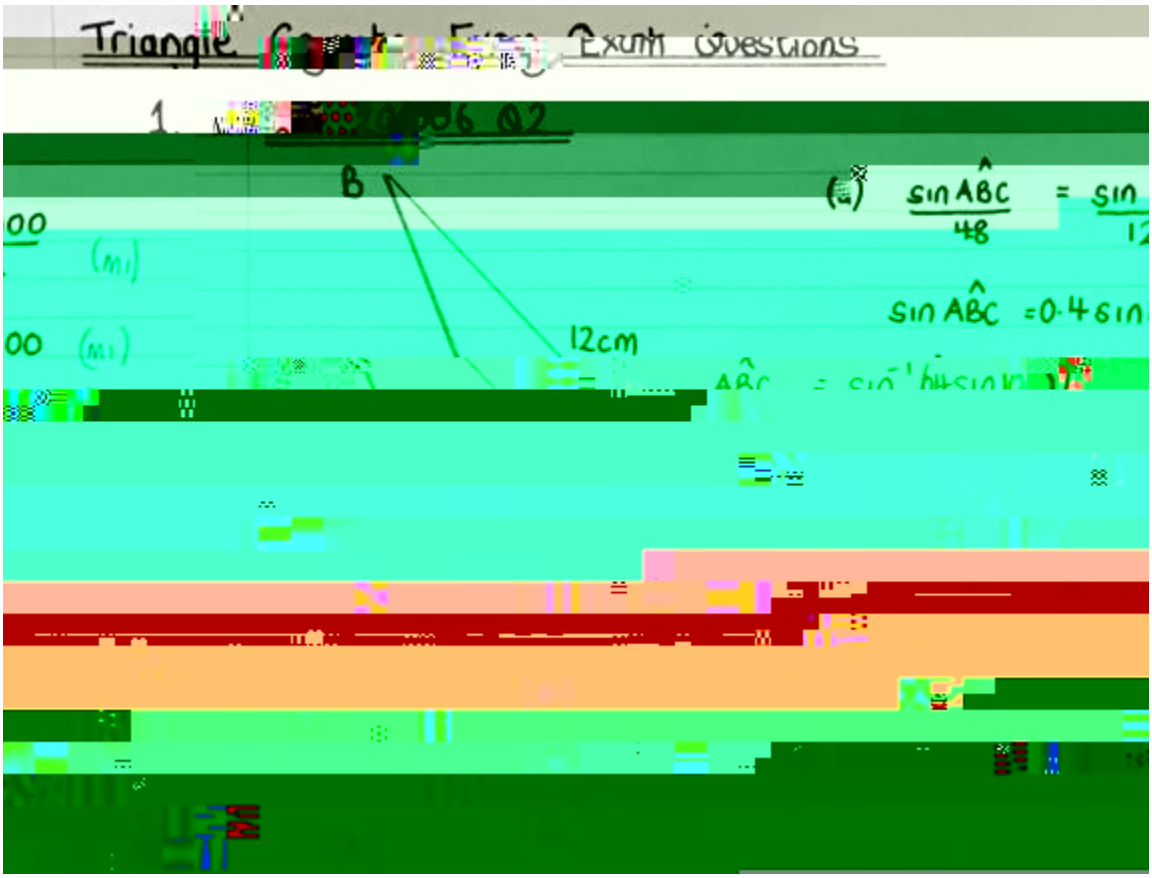
(a) Show that $\theta = 67.9°$ correct to the nearest $0.1°$ (3 marks)

(b) (i) Calculate the area of triangle ABC, giving your answer, in cm^2, to three significant figures. (2 marks)

(ii) The line through A, perpendicular to BC, meets BC at the point D. Calculate the length of AD, giving your answer in appropriate three significant figures. (3

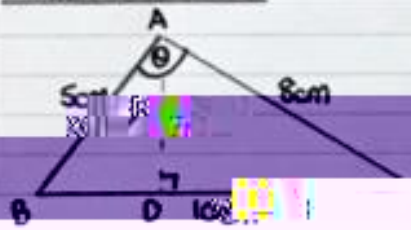
The diagram shows a triangle ABC.

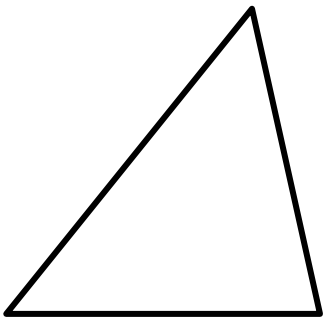


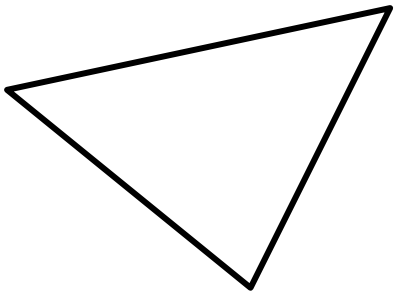


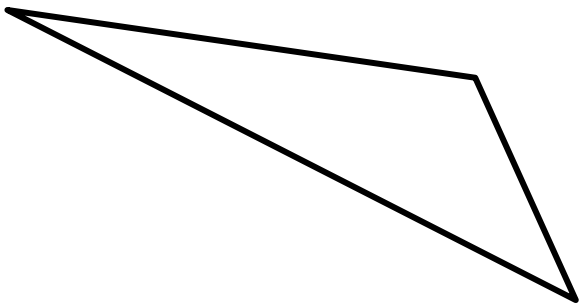
2 Jan 2007

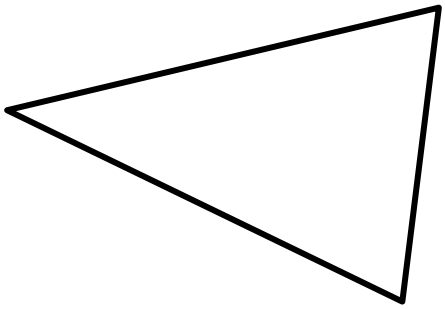
4. Jan 2011 Q3

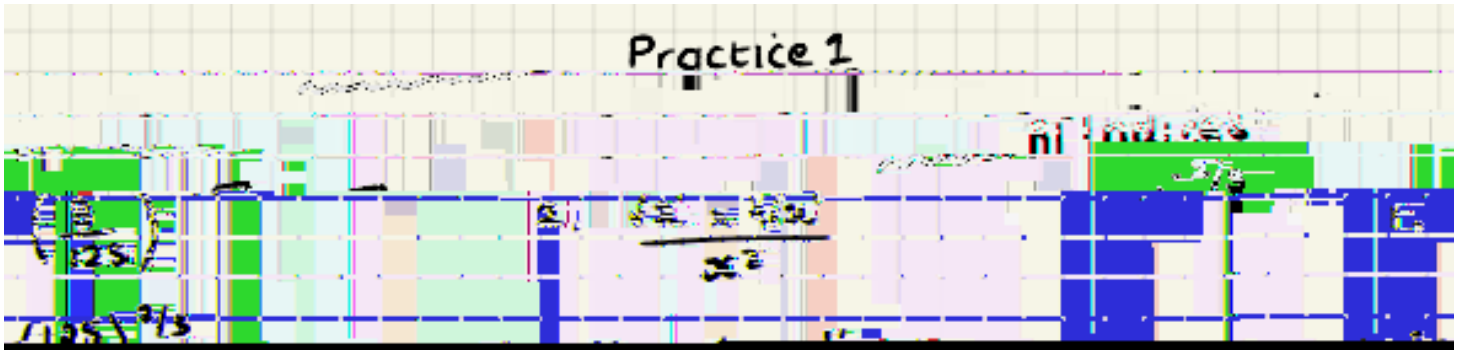


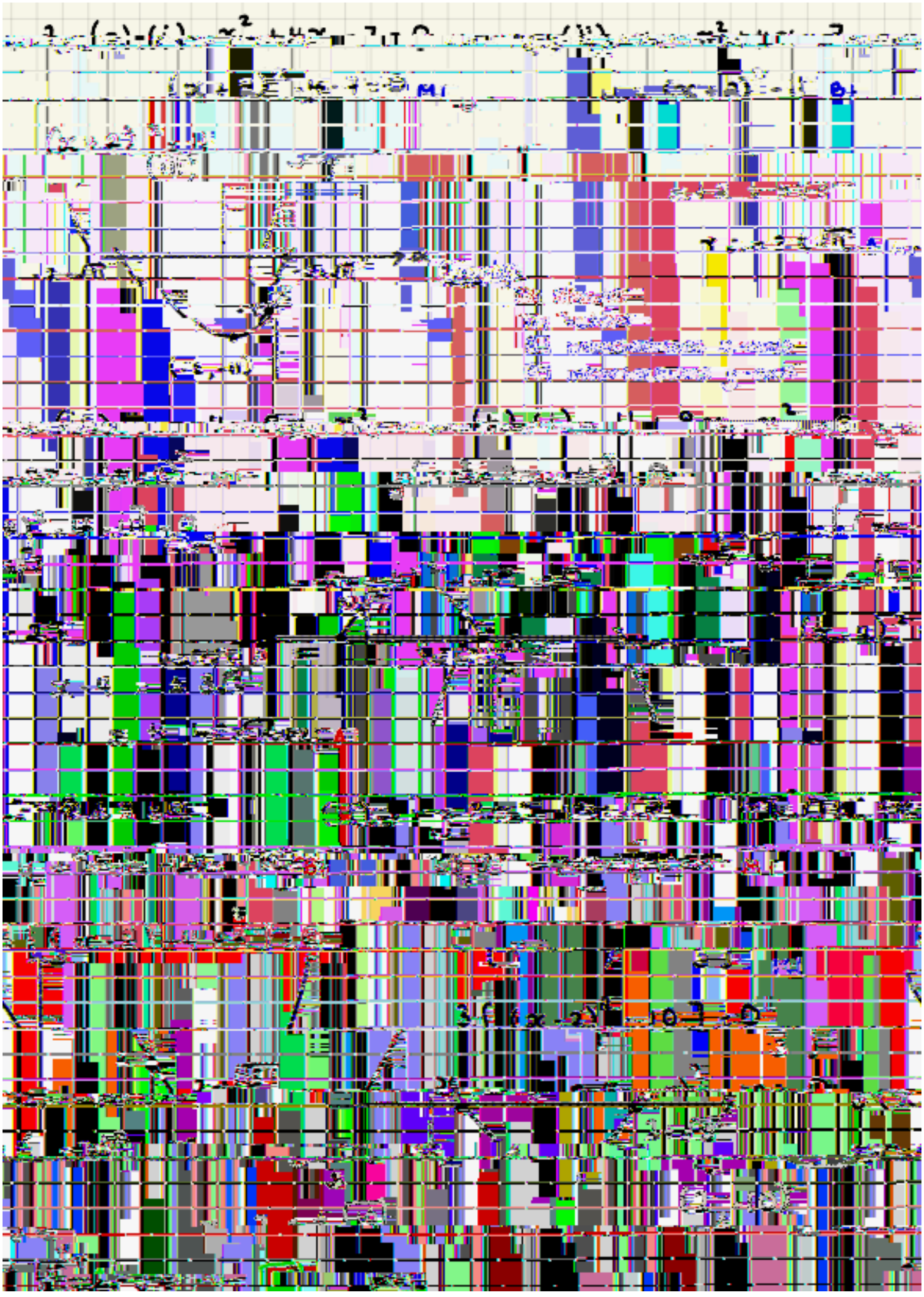




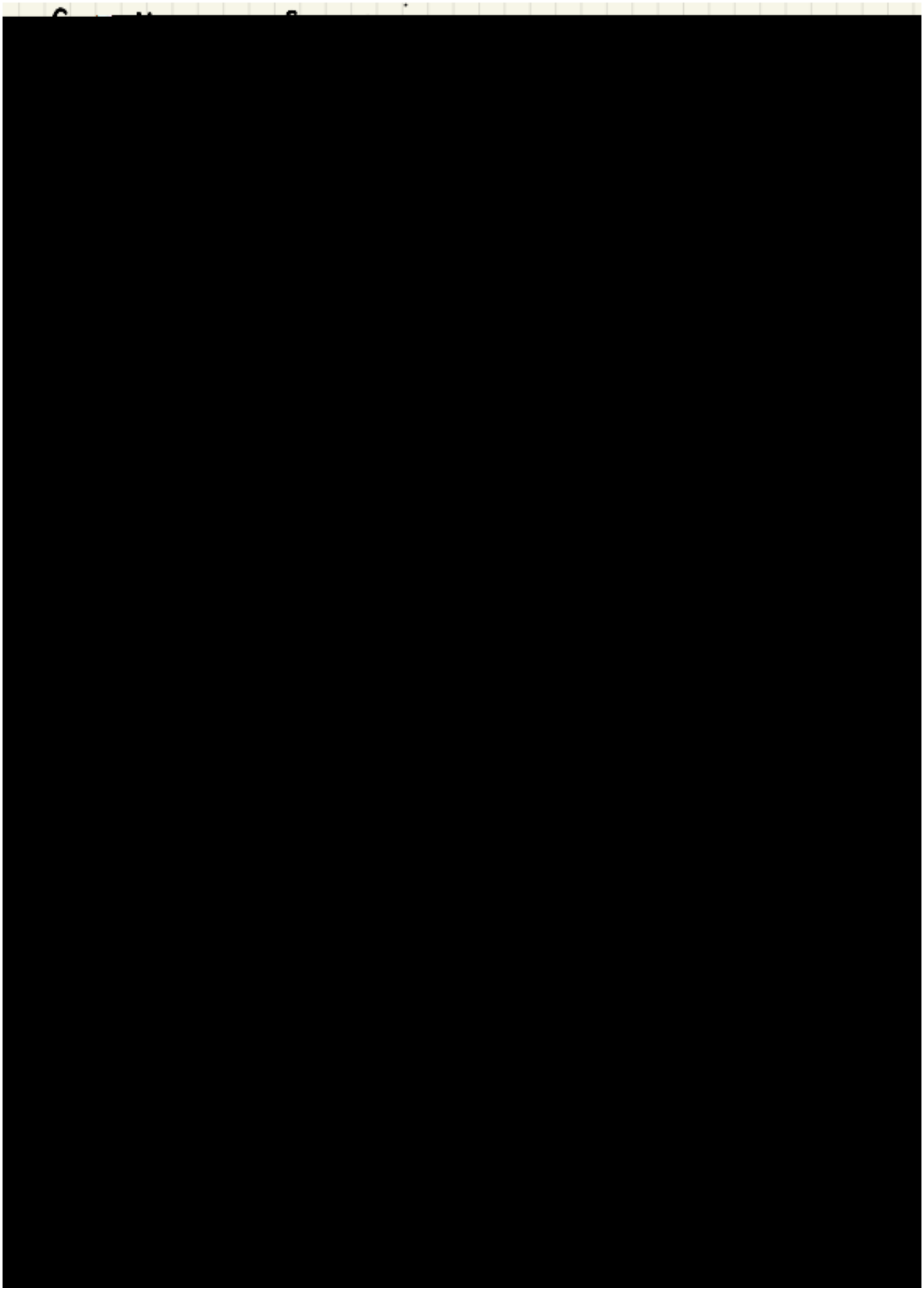


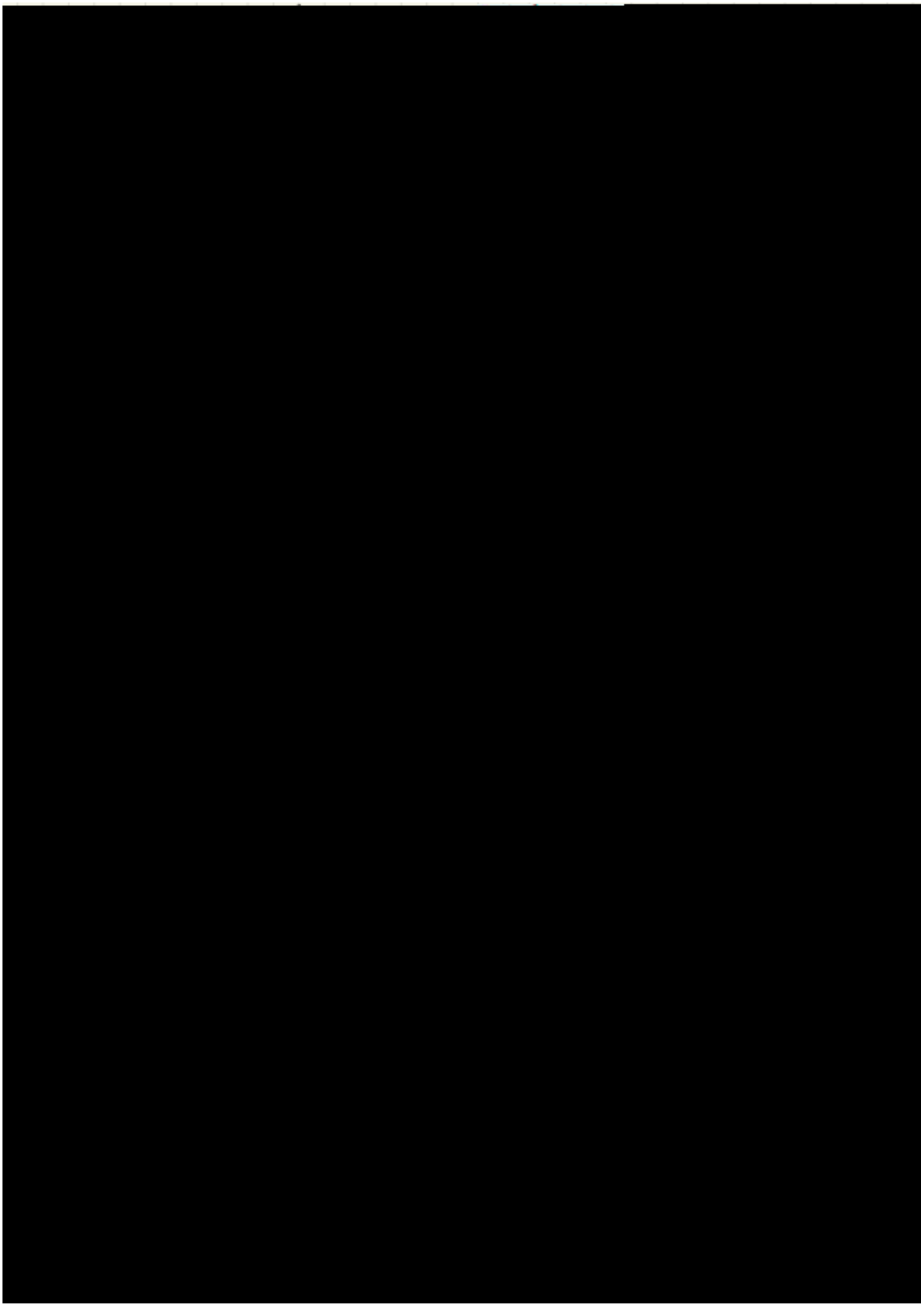


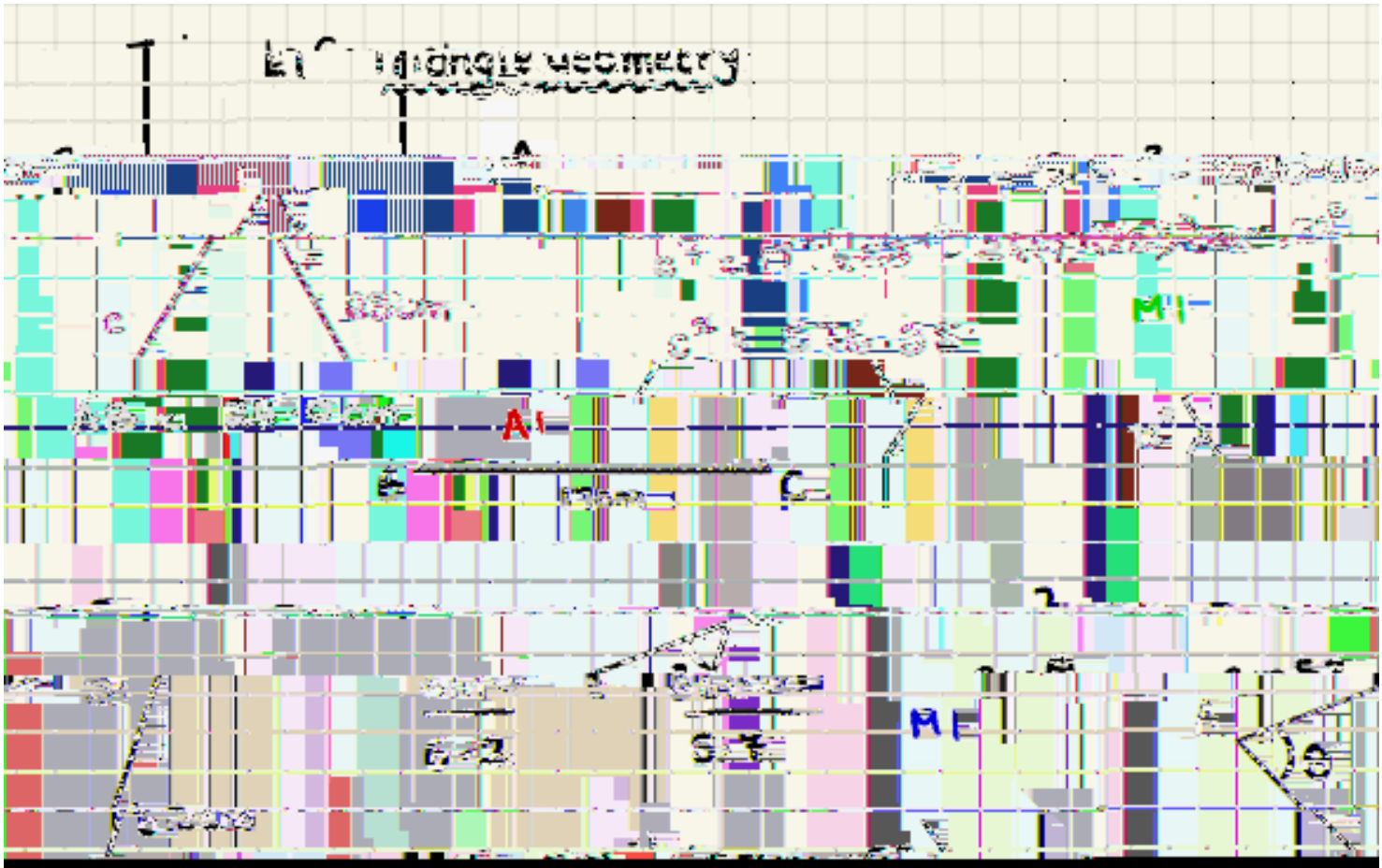

Practice 1

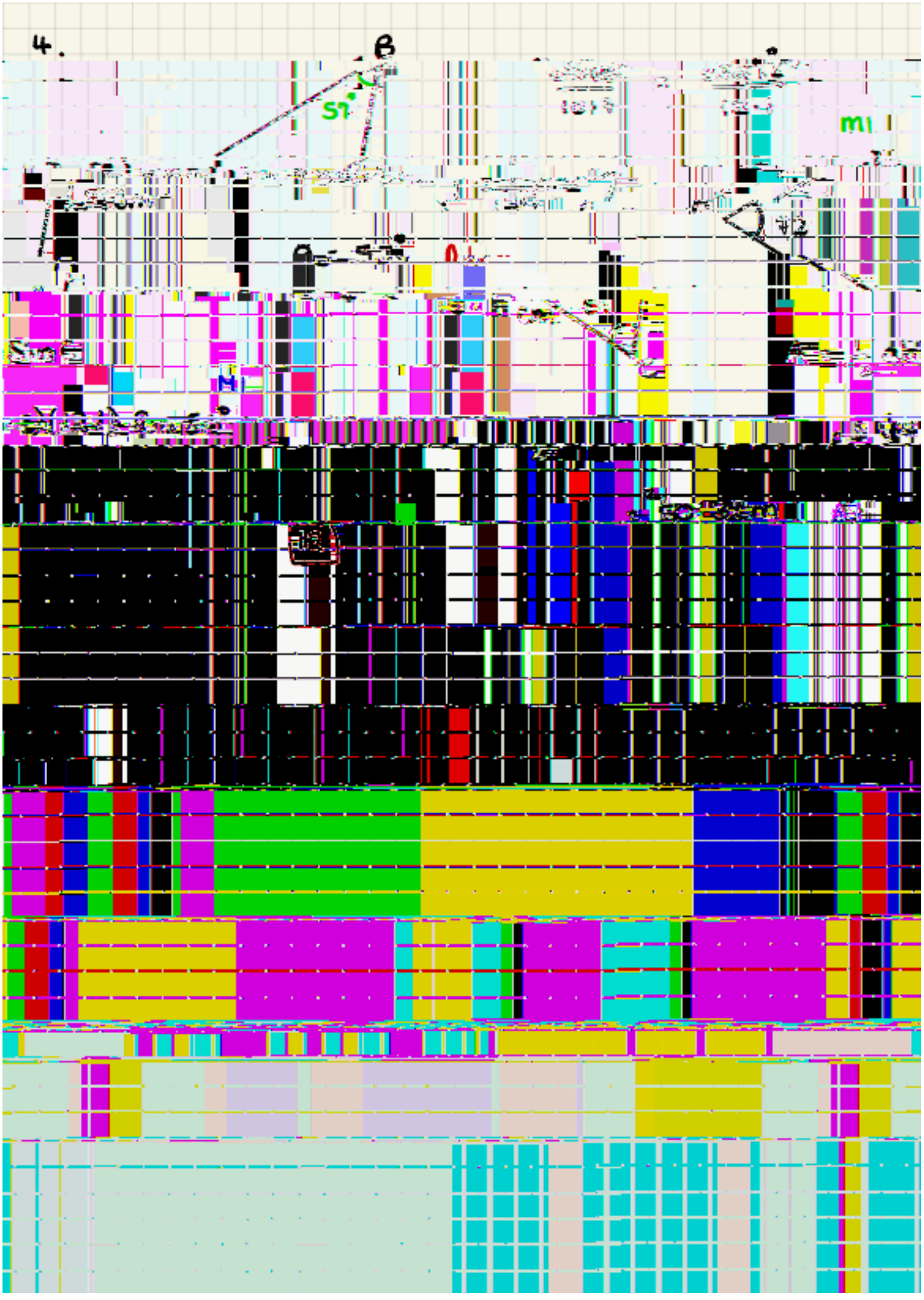


3. (a)

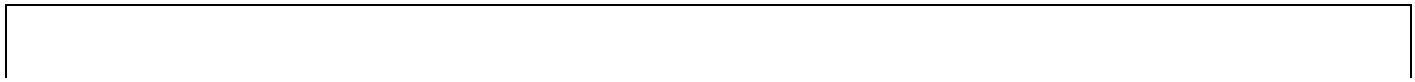


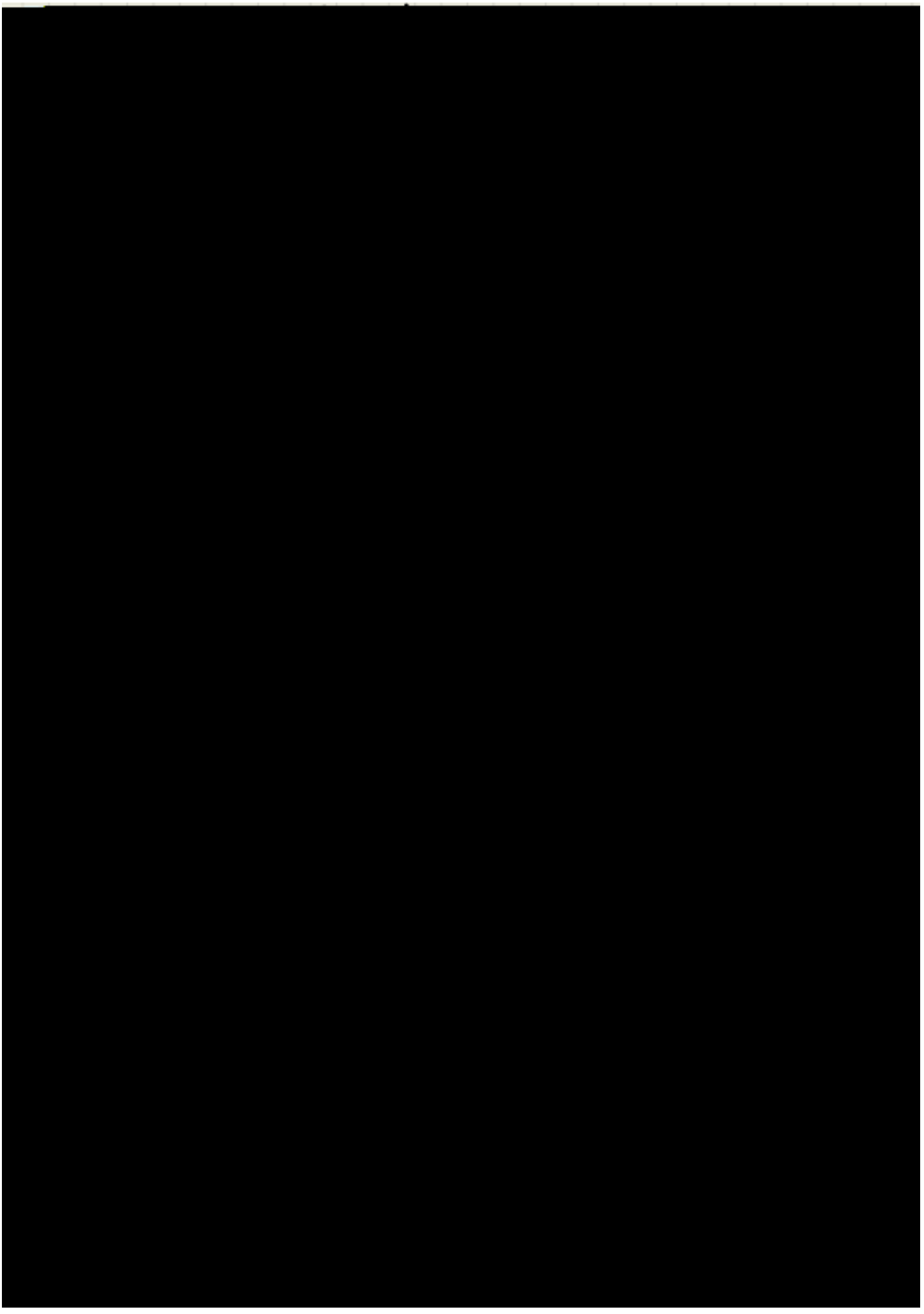




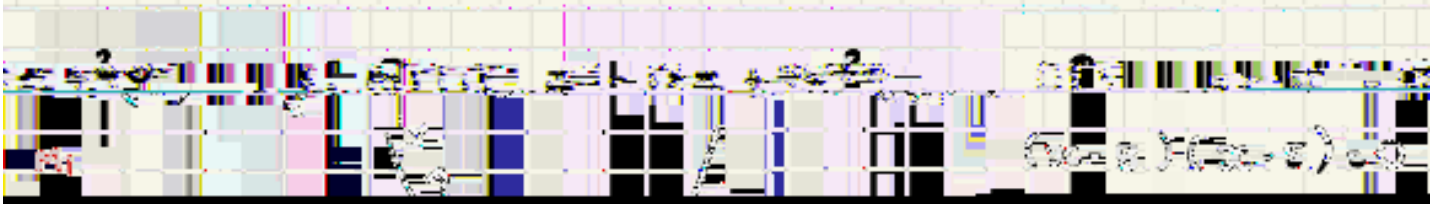

4.
B
S1
m1

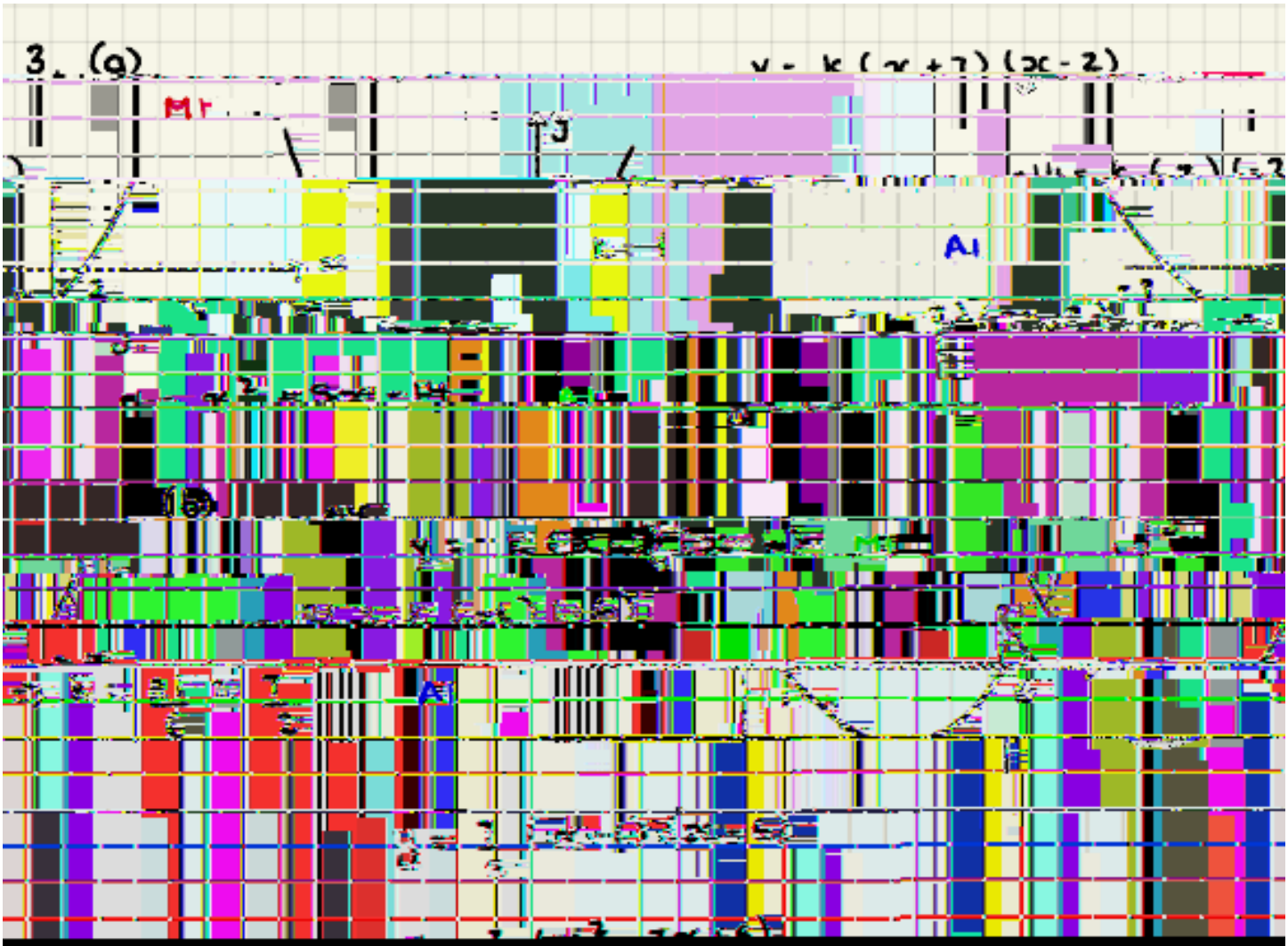
without

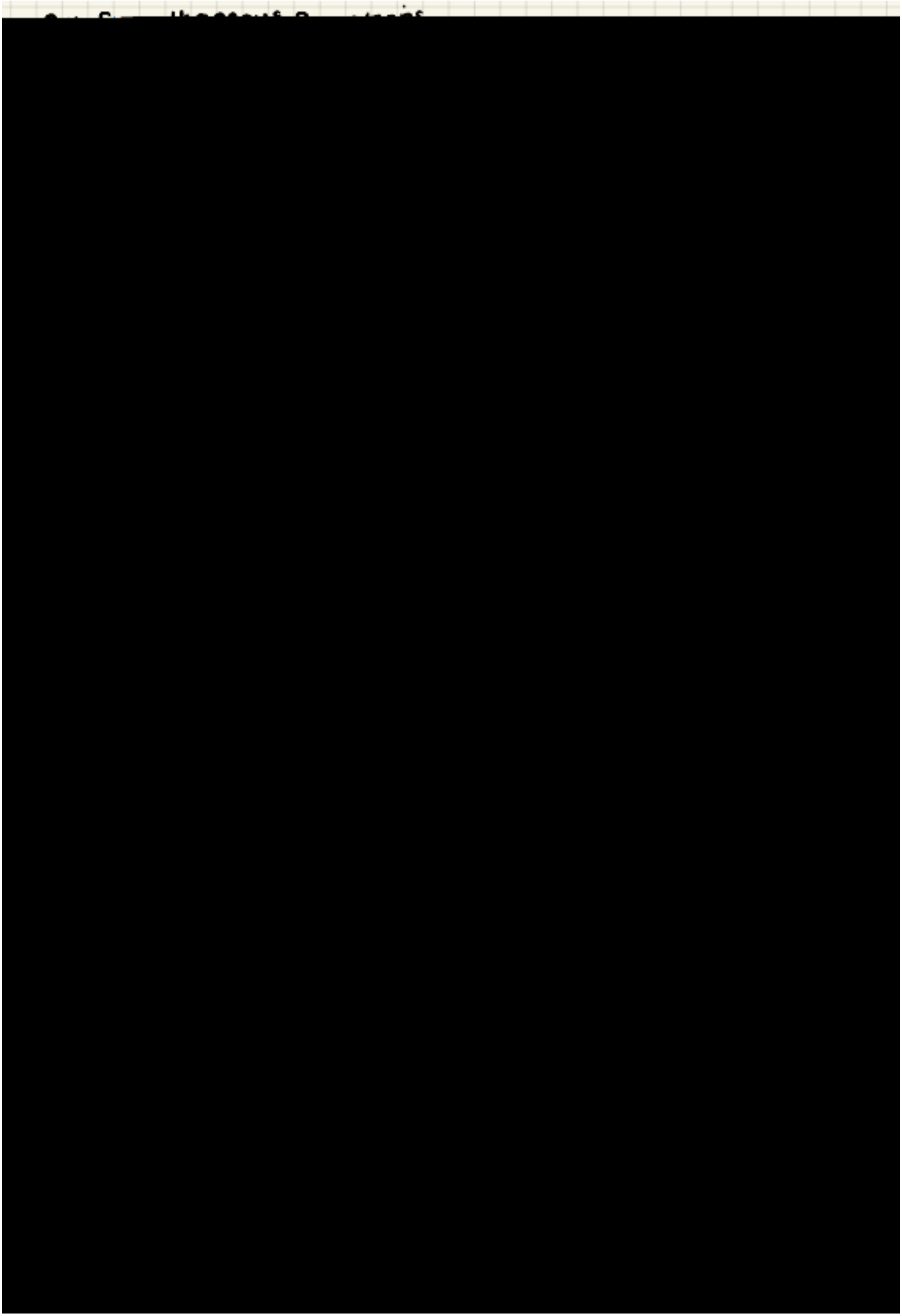


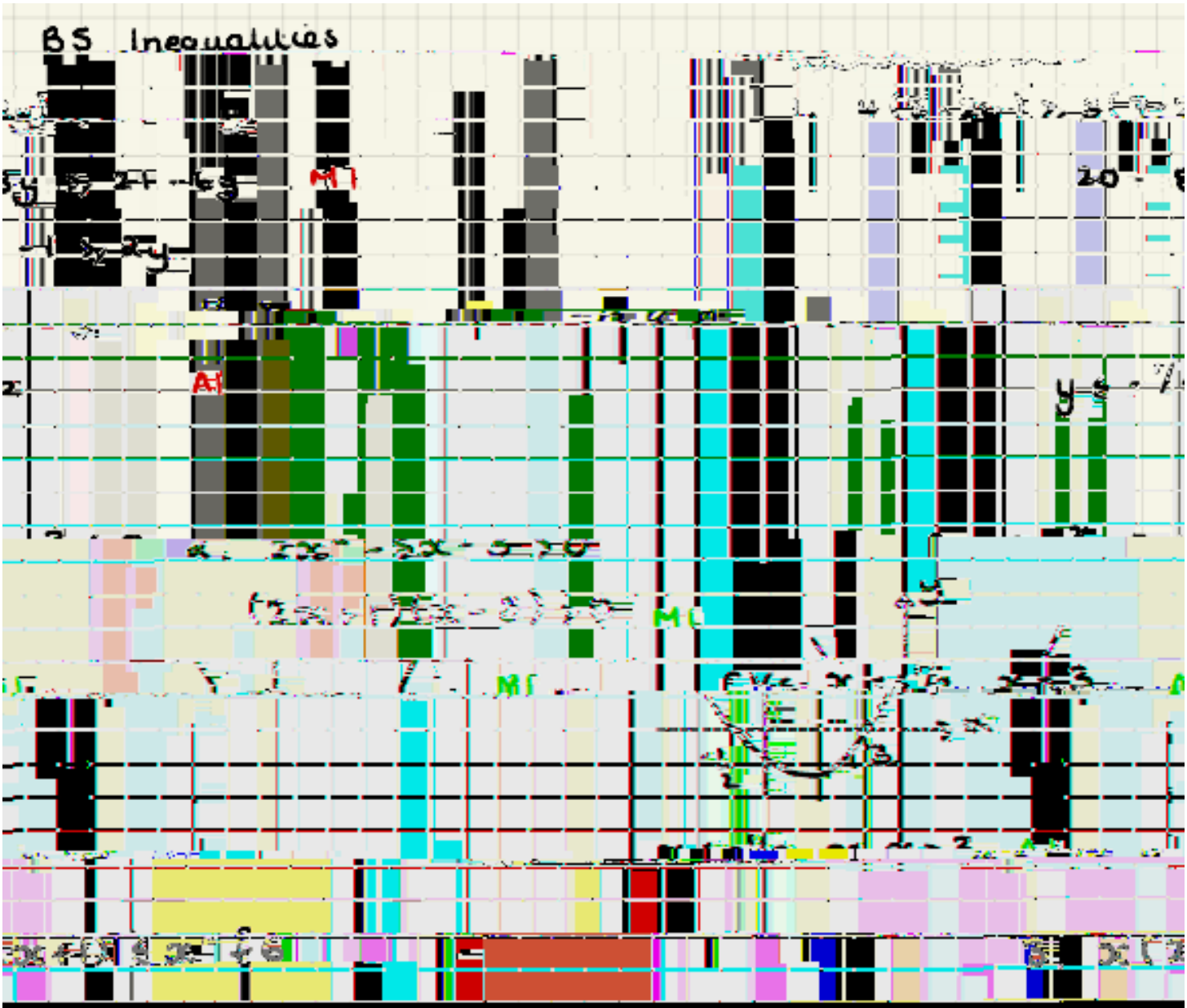


B3 Quadratics




3. (a)
y = k (x + 7) (x - 2)
M1
A1
A1




BS Inequalities