Write your name, centre number and candidate number in the boxes below.

Surname	Other names

Centre number | | | | | |

Candidate number | | | | |

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Histograms

Time allowed: 45 minutes

Subject code **0580**

Mathematics

Questions from Paper 2 and Paper 4

You must have: a ruler marked in centimetres and millimetres, a protractor, compasses, a pen, an HB pencil and an eraser.
You may use a calculator.

Total marks

/ 36

Instructions

- Answer every question in the space provided on this paper.
- Write in black or dark blue ink. Pencil may be used for diagrams and graphs.
- Fill in your name, centre number and candidate number above.
- Show your working: a correct method can earn marks even if the answer is wrong.
- Unless a question says otherwise, give answers that are not exact to 3 significant figures, and angles in degrees to 1 decimal place.

Information

- This paper has 10 questions worth 36 marks in total.
- The marks for each question or part are shown in brackets, for example [3].

Advice

- Read every question through once before you write anything.
- Use the marks in brackets to judge how long to spend on each part.
- If you finish early, go back and check your working.

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Print at 100% (Actual size) so diagrams keep their real measurements.

1

Height (h cm)	$0 < h \leqslant 10$	$10 < h \leqslant 15$	$15 < h \leqslant 30$
Frequency	25	u	9
Frequency density	2.5	4.8	v

The table shows information about the heights of some flowers.

Calculate the values of u and v.

Answer u = ...

v = ... [2]

Histograms Click for more variations

1	$u = 24(.0)$, $v = 0.6$	**2**	**B1** each

2

Mass of parcel (m kilograms)	$0 < m \leqslant 0.5$	$0.5 < m \leqslant 1.5$	$1.5 < m \leqslant 3$
Frequency	20	18	9

The table above shows information about parcels in a delivery van.

John wants to draw a histogram using this information.
Complete the table below.

Mass of parcel (m kilograms)	$0 < m \leqslant 0.5$	$0.5 < m \leqslant 1.5$	$1.5 < m \leqslant 3$
Frequency density		18	

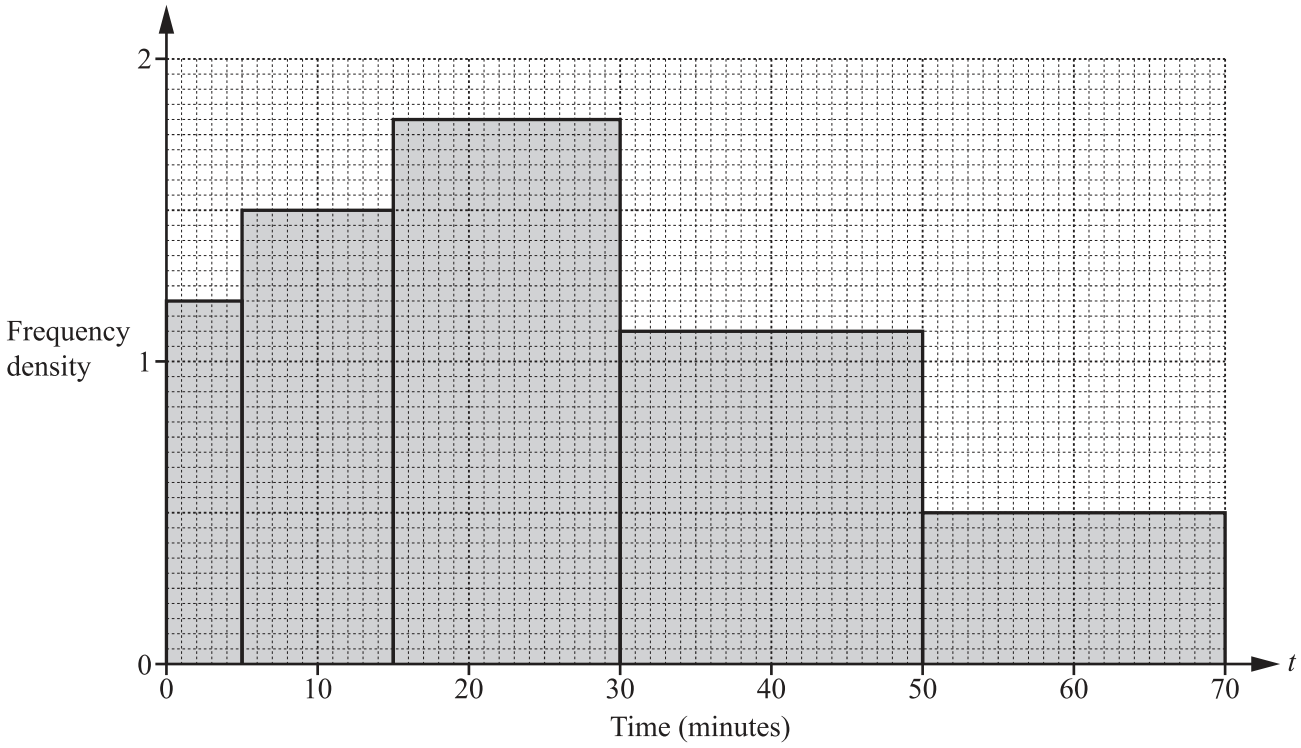
[2]

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Histograms Click for more variations

2	40 6	**2**	**B1** for one correct

3 The histogram shows information about the time, t minutes, spent in a shop by each of 80 people.



Complete the frequency table.

Time (t minutes)	$0 < t \leqslant 5$	$5 < t \leqslant 15$	$15 < t \leqslant 30$	$30 < t \leqslant 50$	$50 < t \leqslant 70$
Number of people	6		27		10

[2]

Histograms Click for more variations

3	15 and 22	**2**	**M1** for 1.5 × 10 or 1.1 × 20

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4 Some students record their reaction times.
The table shows the results.

Reaction time (t seconds)	$0 < t \leqslant 6$	$6 < t \leqslant 10$
Frequency	18	16

On a histogram, the height of the block for the $0 < t \leqslant 6$ interval is 7.5 cm.

Calculate the height of the block for the $6 < t \leqslant 10$ interval.

..... cm [2]

Histograms Click for more variations

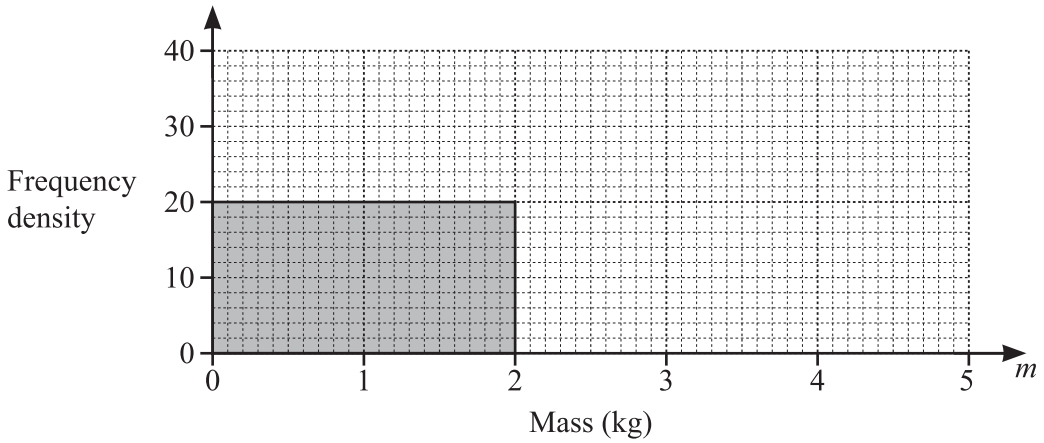
4	10	**2**	**M1** for $\frac{7.5}{18 \div 6}$ oe or better or [frequency densities] 3 and 4 or 45 and $4h$ or 45 and 40

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5 Kai sorts parcels into two types, light and heavy.

Type of parcel	Mass (m kg)
Light	$0 < m \leqslant 2$
Heavy	$2 < m \leqslant 5$

The histogram shows some information about the number of parcels Kai sorts in one day.



(a) Find the number of light parcels.

..... [1]

(b) There are 102 heavy parcels.

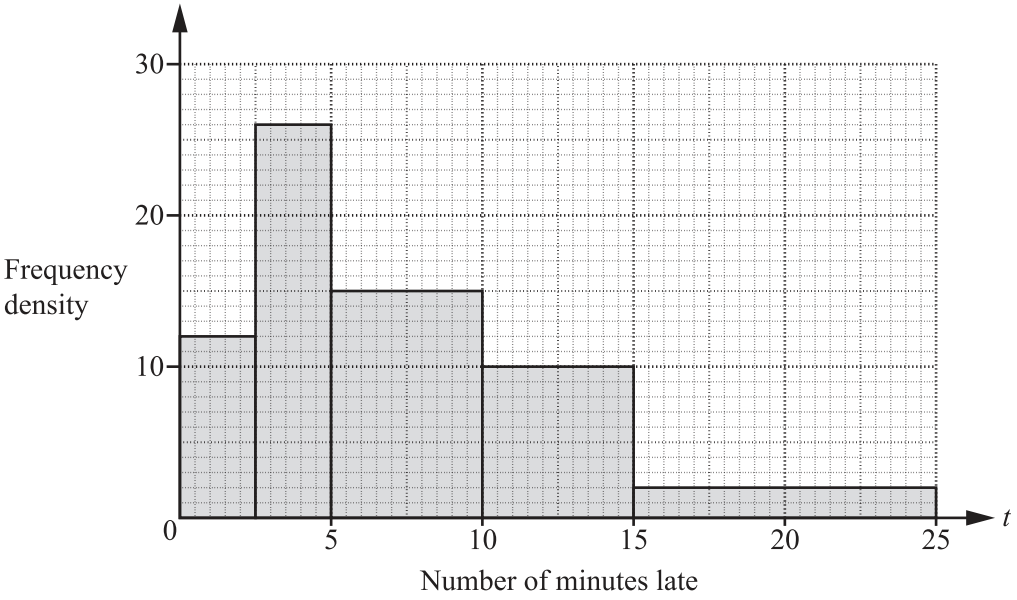
Complete the histogram. [2]

(a) Histograms (b) Histograms Click for more variations

5(a)	40	**1**	
5(b)	Correct column, from 2 to 5 and height 34	**2**	**M1** for $\frac{102}{5-2}$

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6 Deborah records the number of minutes late, t, for trains arriving at a station.
The histogram shows this information.



(a) Find the number of trains that Deborah recorded.

..... [2]

(b) Calculate the percentage of the trains recorded that arrived more than 10 minutes late.

.....% [2]

(a) Histograms (b) Basic percentages Click for more variations

6 (a)	240	**2**	**M1** for any three pairs of products from 2.5 × 12, 2.5 × 26, 5 × 15, 5 × 10, 10 × 2
(b)	29.2 or 29.16 to 29.17	**2**	**M1** for (5 × 10 + 10 × 2) / *their* (a) or for their total of the bars above 10 minutes ÷ *their* (a)

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7 The table shows some information about the mass, m grams, of 200 bananas.

Mass (m grams)	$90 < m \leqslant 110$	$110 < m \leqslant 120$	$120 < m \leqslant 125$	$125 < m \leqslant 140$
Frequency	40	70	60	30
Height of column in histogram (cm)			6	

Complete the table.

[4]

Histograms Click for more variations

7	1 3.5 1	**4**	**B3** for 2 correct **B2** for 1 correct or **M1** for 2, 7, […] and 2 seen [FDs]

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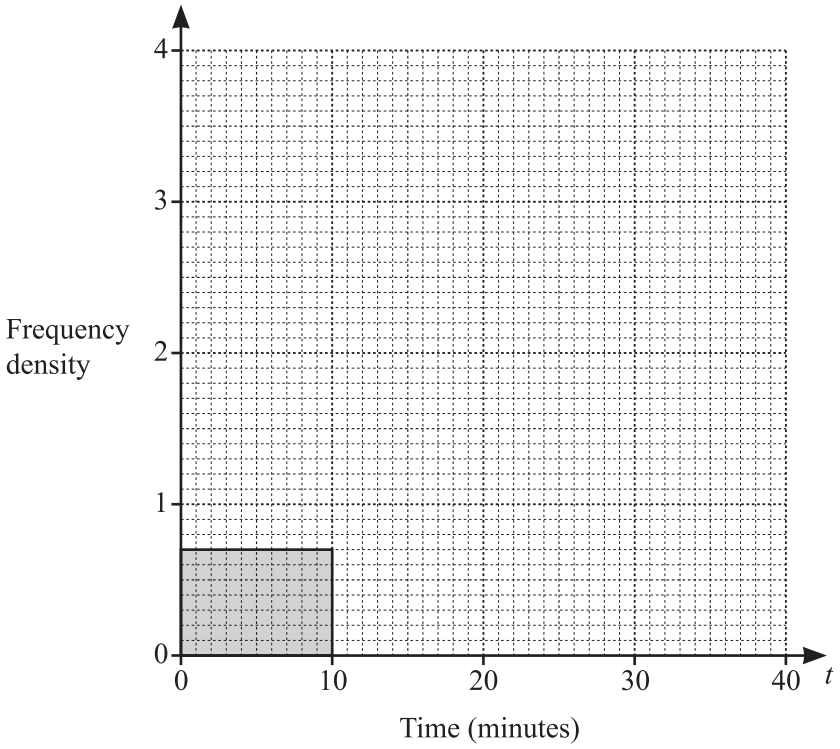
8 The time, t minutes, it takes each of 50 students to travel to school is recorded.
The table shows the results.

Time (t minutes)	$0 < t \leqslant 10$	$10 < t \leqslant 15$	$15 < t \leqslant 20$	$20 < t \leqslant 40$
Frequency	7	19	16	8

(a) Write down the modal class.

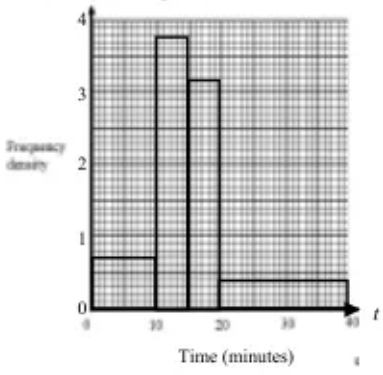
..... $< t \leqslant$ ..... min [1]

(b) On the grid, complete the histogram to show the information in the table.

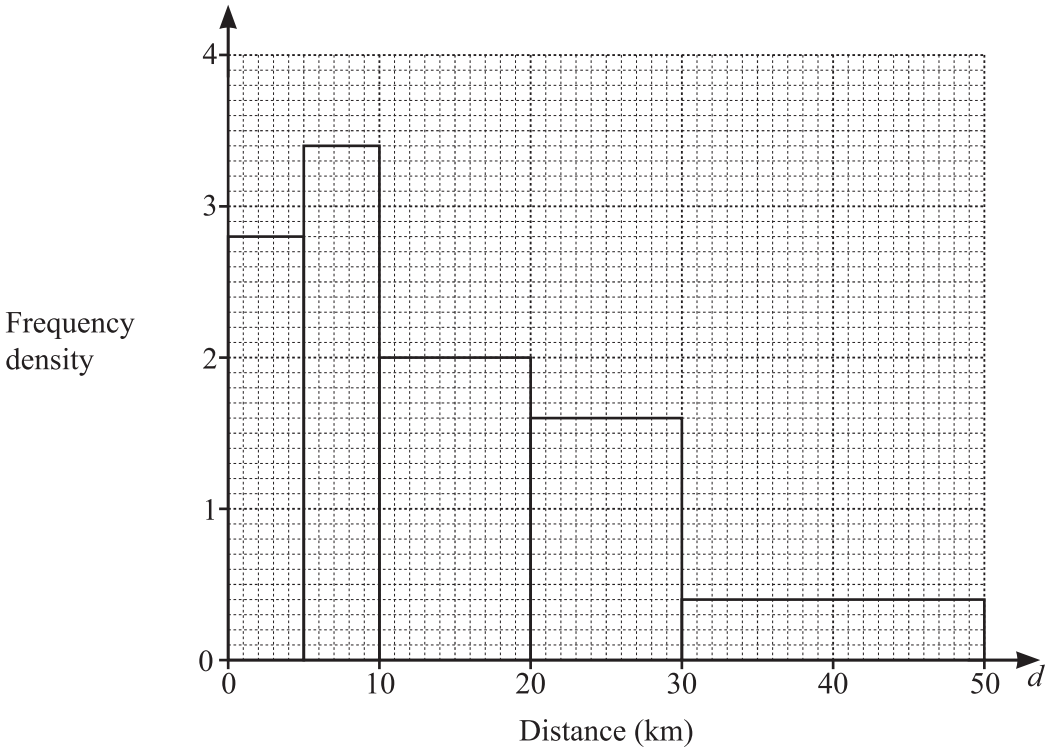


[3]

(a) Averages from grouped data (b) Histograms Click for more variations

8(a)	$10 [< t \leqslant] 15$	**1**	
8(b)	Correct histogram 	**3**	**B1** for each correct block If 0 scored, **SC1** for correct frequency densities 3.8, 3.2, 0.4 soi by correct heights

9 The histogram shows information about the distance some people travel to work.



(a) Use the histogram to complete the table.

Distance ($d$km)	Number of people
$0 < d \leqslant 5$	
$5 < d \leqslant 20$	
$20 < d \leqslant 50$	

[3]

(b) The people who travel a distance greater than 35 km to work have a car allowance.

Calculate an estimate of the number of these people who have a car allowance.

..... [1]

(a) Histograms (b) Histograms Click for more variations

9(a)	14 37 24	**3**	**B1** for each correct answer
9(b)	6	**1**	

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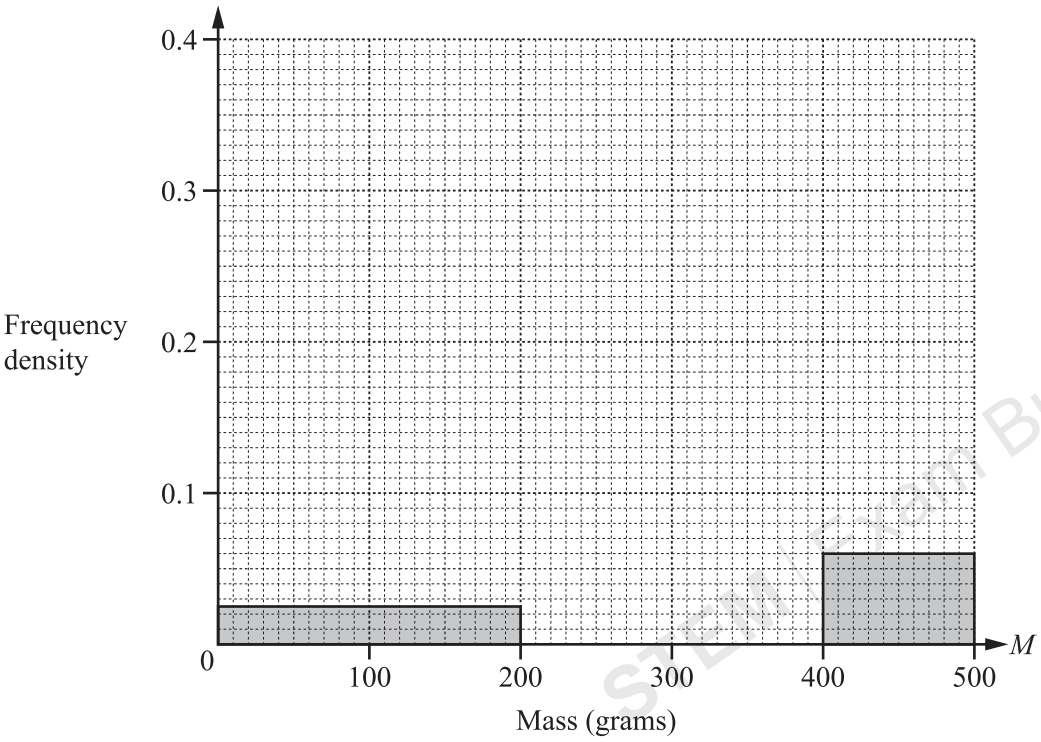
10 **(a)** A group of 50 students estimated the mass, M grams, of sweets in a jar.
The results are shown in the table.

Mass (M grams)	Number of students
$0 < M \leqslant 200$	5
$200 < M \leqslant 300$	9
$300 < M \leqslant 350$	18
$350 < M \leqslant 400$	12
$400 < M \leqslant 500$	6

(i) Calculate an estimate of the mean.

Answer(a)(i) ..... grams [4]

(ii) Complete this histogram to show the information in the table.

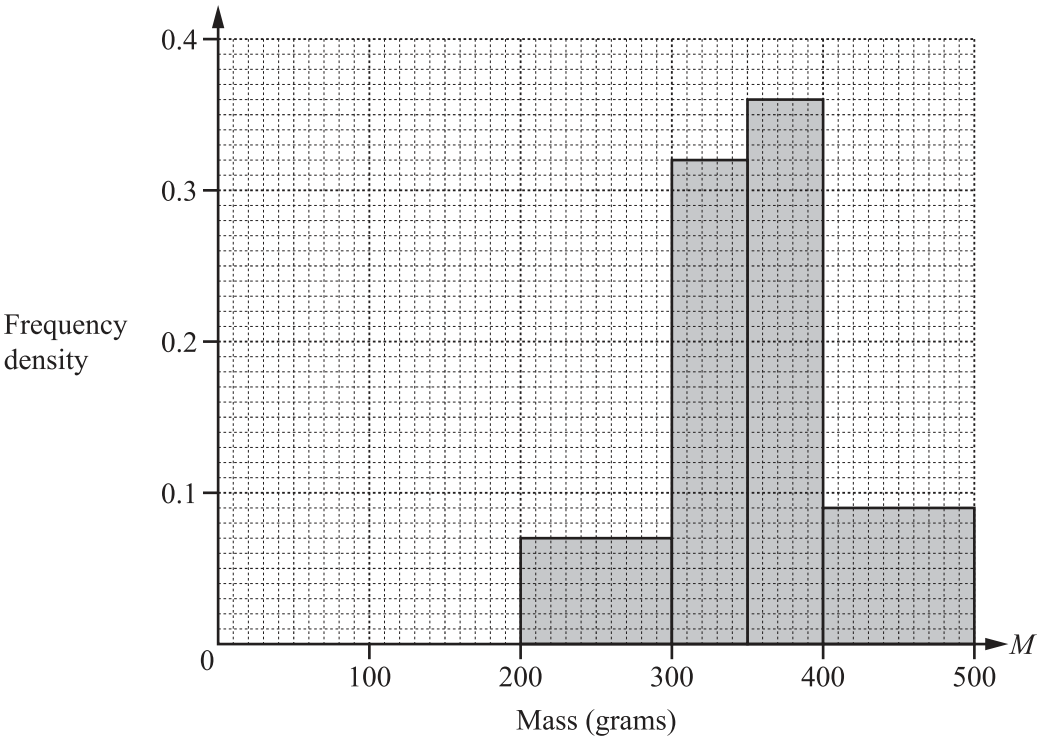


[3]

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(b) A group of 50 adults also estimated the mass, M grams, of the sweets in the jar.
The histogram below shows information about their estimates.

Use the histograms to make two comparisons between the distributions of the estimates of the students and the adults.



Answer(b)

1 .....

.....

2 .....

..... [2]

(a)(i) Averages from grouped data (a)(ii) Histograms (b) Histograms Click for more variations

10	**(a)** **(i)**	316	**4**	**M1** for 100, 250, 325, 375, 450 soi **M1** for Σfm with m's in intervals including boundaries [15800] **M1** (dep on 2nd **M1**) for *their* $\Sigma fm \div 50$
	(ii)	Three correct blocks with heights 0.09, 0.36, 0.24 with correct widths and no gaps	**3**	**B2** for two correct blocks or **B1** for one correct block or three correct frequency densities soi
	(b)	Students have a greater range of estimates oe	**B1**	
		[On average] adults estimated a greater mass oe	**B1**	

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