

Complete solutions to Exercise 16 (a)

1. (a) Continuous (b) Discrete (c) Discrete
 (d) Continuous (e) Continuous

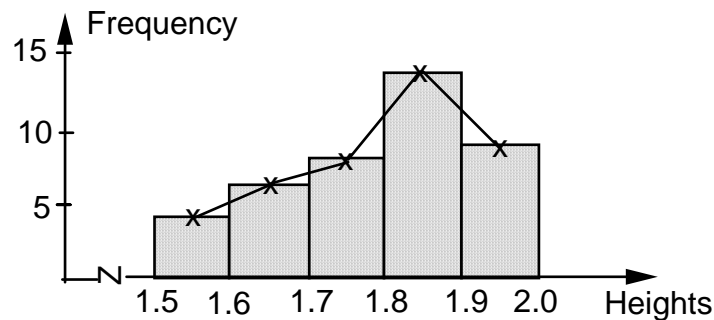
2. The Table of values is

Temperature °C	15	16	17	18	19	20	21	22	23	24	25	26
Frequency	1	2	3	1	2	5	4	3	5	2	1	1

3. The smallest height = 1.53 and largest is 1.99, divide into 1.5-1.6, 1.6-1.7, 1.7-1.8, ...

Height $h(m)$	Frequency
$1.5 \leq h < 1.6$	4
$1.6 \leq h < 1.7$	6
$1.7 \leq h < 1.8$	7
$1.8 \leq h < 1.9$	14
$1.9 \leq h < 2.0$	9

4. 5.

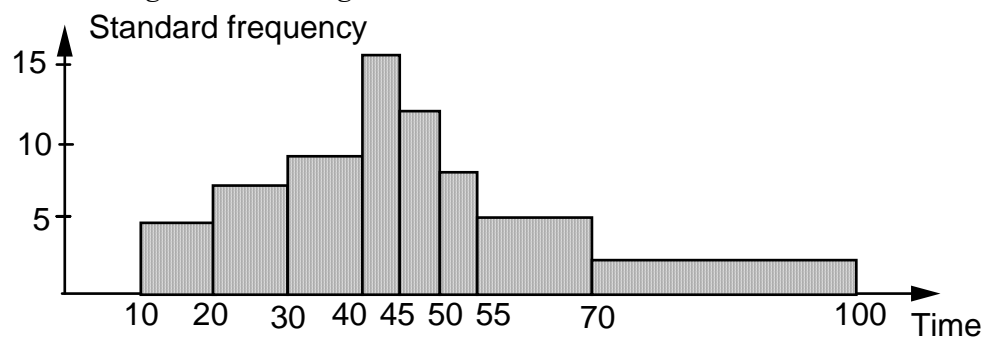


Frequency polygon and histogram of heights of students.

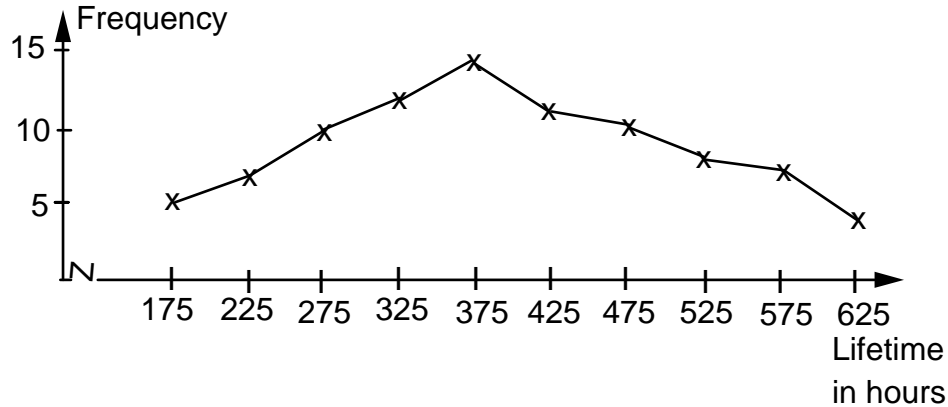
6. By looking at the data, the most suitable class width size seems to be 5. Standard width (s.w.) = 5. Hence we have the table

Time taken t	Class width	Frequency	Standard Frequency
$10 \leq t < 20$	10 $2 \times \text{s.w.}$	10	$10/2=5$
$20 \leq t < 30$	10 $2 \times \text{s.w.}$	14	$14/2=7$
$30 \leq t < 40$	10 $2 \times \text{s.w.}$	18	$18/2=9$
$40 \leq t < 45$	5 s.w.	16	16
$45 \leq t < 50$	5 s.w.	12	12
$50 \leq t < 55$	5 s.w.	8	8
$55 \leq t < 70$	15 $3 \times \text{s.w.}$	15	$15/3=5$
$70 \leq t < 100$	30 $6 \times \text{s.w.}$	12	$12/6=2$

The histogram showing this data is:



7. We take the midpoint of the Lifetime. For example 150-200 we plot 175 with a frequency of 5.



8. Standard width size = 0.05. That is s.w. = 0.05. We have

Diameter d (in mm)	Class width	Frequency	Standard Frequency
$86.00 \leq d < 86.10$	0.1 $2 \times \text{s.w.}$	9	$9/2=4.5$
$86.10 \leq d < 86.15$	0.05 s.w.	9	9
$86.15 \leq d < 86.25$	0.1 $2 \times \text{s.w.}$	12	$12/2=6$
$86.25 \leq d < 86.40$	0.15 $3 \times \text{s.w.}$	15	$15/3=5$
$86.40 \leq d < 86.45$	0.05 s.w.	10	10
$86.45 \leq d < 86.50$	0.05 s.w.	7	7
$86.50 \leq d < 86.70$	0.2 $4 \times \text{s.w.}$	20	$20/4=5$
$86.70 \leq d < 87.00$	0.3 $6 \times \text{s.w.}$	18	$18/6=3$

We plot standard frequency against diameter.

