DSE Math cut off score
DSE 數學 cut off 分數

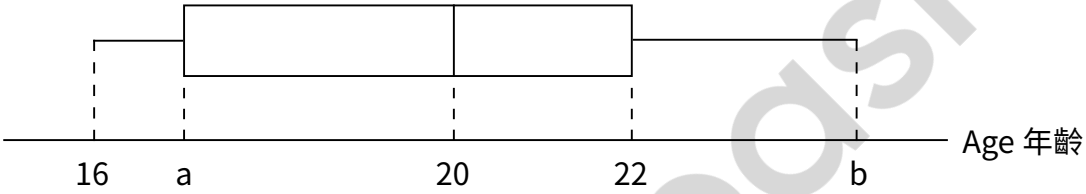
Grade	2021 (%)	2020 (%)	2019 (%)	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)
5**	90	94	90	90	93	92	93	92
5*	84	87	84	83	87	86	87	87
5	77	79	76	77	82	78	80	79

	Paper 1 卷一			**Paper 2 卷二**
Section 部分	A(1)	A(2)	B	
Full marks 總分	35	35	35	45

DSE A(2) Advanced Statistics
DSE 甲 (2) 高階統計

Example 例題：

1. The box-and-whisker diagram below shows the distribution of the ages of the members of the football club. It is given that a and b are integers. Also, the range of this distribution is double of the interquartile range of this distribution.
下面的框線圖顯示某足球隊成員的年齡分佈。已知 a 及 b 為一整數，且這分佈的分佈域為這分佈的四分位數間距的兩倍。



(a) Find a and b.
求 a 及 b 。

(b) If there are 7 members in the club and there is only one mode of the ages of the members of the club, find the least possible mode of the ages of the members of the club.
若該隊有 7 名成員而該隊成員的年齡只有一個眾數，求該隊成員的年齡的最小可取眾數。

(c) If there are 11 members in the club, find the least possible mean of the ages of the members of the club.
若該隊有 11 名成員，求該隊成員的年齡的最小可取平均值。

Example 例題：

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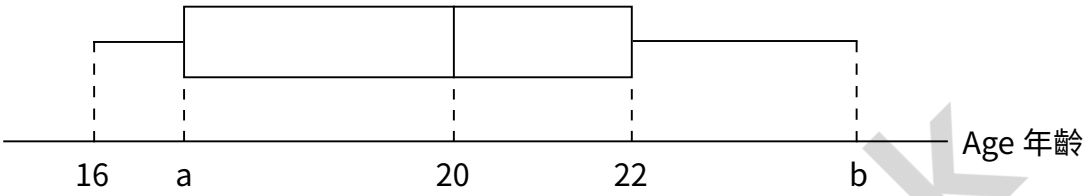

(a) Find a and b.
求 a 及 b 。

$b - 16 = 2(22 - a)$
$b - 16 = 44 - 2a$
$b + 2a = 60$

Consider $16 < a < 20$ and $b > 22$

Possible combination on of a and b: $a = 17, b = 26$
$a = 18, b = 24$

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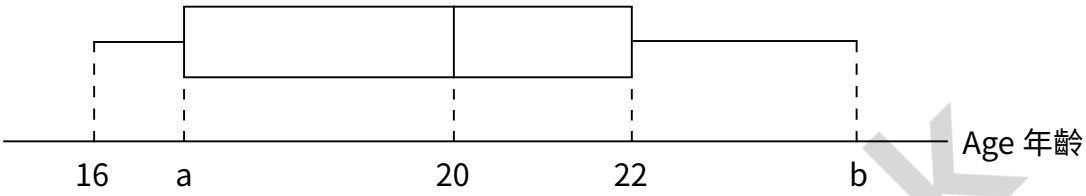
下面的框線圖顯示某足球隊成員的年齡分佈。已知 a 及 b 為一整數，且這分佈的分佈域為這分佈的四分位數間距的兩倍。



(b) If there are 7 members in the club and there is only one mode of the ages of the members of the club, find the least possible mode of the ages of the members of the club.
若該隊有 7 名成員而該隊成員的年齡只有一個眾數，求該隊成員的年齡的最小可取眾數。

The ages of the 7 members of the club : 16、a、m、20、n、22、b
Where $a \leq m \leq 20$ and $20 \leq n \leq 22$

Possible combination of a and b: a = 17, b = 26
a = 18, b = 24

Required : 17

Example 例題：

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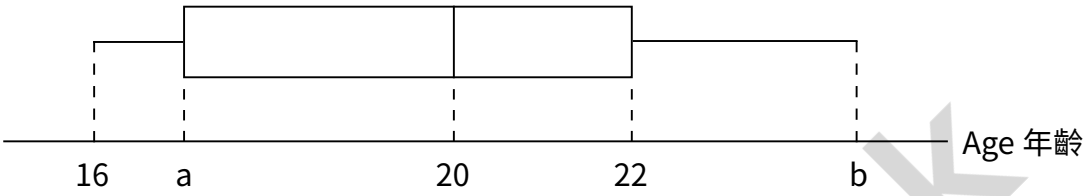

(c) If there are 11 members in the club, find the least possible mean of the ages of the members of the club.
若該隊有 11 名成員，求該隊成員的年齡的最小可取平均值。

The ages of the 11 members of the club: 16、h、a、k、p、20、q、r、22、w、b

When a = 17, b = 26 16、h、17、k、p、20、q、r、22、w、26

h =

k =

p = Mean: $\frac{16+16+17+17+17+20+20+20+22+22+26}{11} = \frac{213}{11}$

q =

r =

w =

When a = 18, b = 24 16、h、18、k、p、20、q、r、22、w、24

h =

k =

p = Mean: $\frac{16+16+18+18+18+20+20+20+22+22+24}{11} = \frac{214}{11}$

q =

r =

w =

Example 例題：

2. The stem-and-leaf diagram below shows the distribution of the ages of the members in a singing class.
下面幹葉圖顯示某唱歌班會員的年齡的分佈。

Stem 幹 (tens 十位)	Leaf 葉 (units 個位)
1	4 9
2	5 6 6
3	0 1 2 3 5 6
4	1 3 4 5 5 6 9
5	2 4 4 4 8
6	8

(a) Find the mean, median and the range of the distribution.
求該分佈的平均數，中位數及分佈域。

(b) Three more members now join the class. It is found that the mean, the median and the range of the distribution of the ages of the members remain unchanged. Find the new distribution of the greatest possible value of the standard deviation.
三位新會員加入該唱歌班。已知該分佈的平均數，中位數及分佈域均保持不變。求新分佈中最大標準差的可取值。

Example 例題：

2. The stem-and-leaf diagram below shows the distribution of the ages of the members in a singing class.
下面幹葉圖顯示某唱歌班會員的年齡的分佈。

Stem 幹 (tens 十位)	Leaf 葉 (units 個位)
1	4 9
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4	1 3 4 5 5 6 9
5	2 4 4 4 8
6	8

(a) Find the mean, median and the range of the distribution.
求該分佈的平均數，中位數及分佈域。

Mean: 40

Median: $\frac{41+43}{2} = 42$

Range: 68 – 14 = 54

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   下面幹葉圖顯示某唱歌班會員的年齡的分佈。

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5	2 4 4 4 8
6	8

(b) Three more members now join the class. It is found that the mean, the median and the range of the distribution of the ages of the members remain unchanged. Find the new distribution of the greatest and the least possible value of the standard deviation.
三位新會員加入該唱歌班。已知該分佈的平均數，中位數及分佈域均保持不變。求新分佈中最大及最小標準差的可取值。

Let a, b and c be the ages of the three new members,

As the mean remains unchanged :

$\frac{40\times 24+a+b+c}{27} = 40$. Then a + b + c = 120.

As the median remains unchanged, so a = 42.

Also, since the sd needs to be the greatest, which means the difference between the mean and b and c has to be the greatest,

b = 14, c = 64 or

The possible ages of the 3 new members: 64, 42, 14

Required SD = 14.1

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三位新會員加入該唱歌班。已知該分佈的平均數，中位數及分佈域均保持不變。求新分佈中最大及最小標準差的可取值。

a, 42, c

a + c = 78

Since the sd needs to be the least, which means the difference between the mean and b and c has to be the least,

b = 39, c = 39 or b = 38, c = 40

b = 36, c = 42

The possible ages of the 3 new members: 36, 42, 42

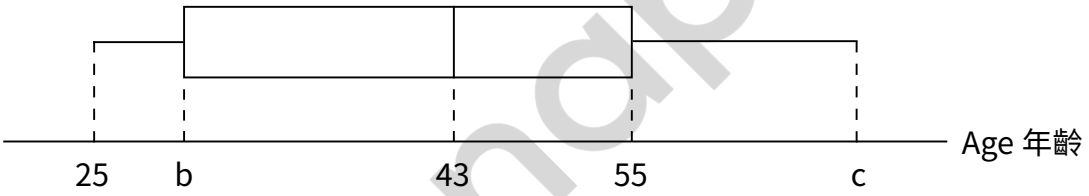
Required SD = 12.6

Example 例題：

3. The stem-and-leaf diagram below shows the distribution of the ages of members in a club.
下面的幹葉圖顯示某俱樂部年齡的分佈。

Stem 幹 (tens 十位)	Leaf 葉 (units 個位)
2	5 6 7 7 8
3	2 2 4 6
4	1 a 9
5	1 2 3 7 8
6	1 2 4

The box-and-whisker diagram below shows the distribution of the ages of members in a club.
下面的框線圖顯示某俱樂部年齡的分佈。



(a) Find a, b and c.
求 a, b 及 c。

(b) Four more members join the club, where the ages of two of them are 42 and 65 respectively. It is given that the median remains unchanged after joining four more members.
四位新會員加入該俱樂部，其中兩人的年齡分別為 42 及 65。已知當四位新會員加入後中位數保持不變。

(i) Write down the greatest possible mode of the distribution.
寫出該分佈最大可取的眾數。

(ii) Find the least and the greatest possible interquartile range of the distribution.
求該分佈最小以及最大可取的四分位數間距。

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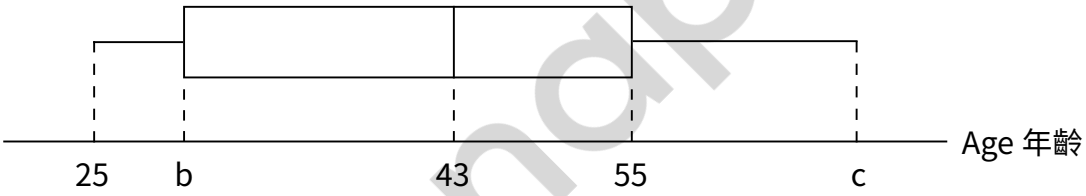

(a) Find a, b and c.
求 a, b 及 c。

$\frac{41+(40+a)}{2} = 43$

$a = 5$

$\frac{28+32}{2} = b$

$b = 30$

$c = 64$

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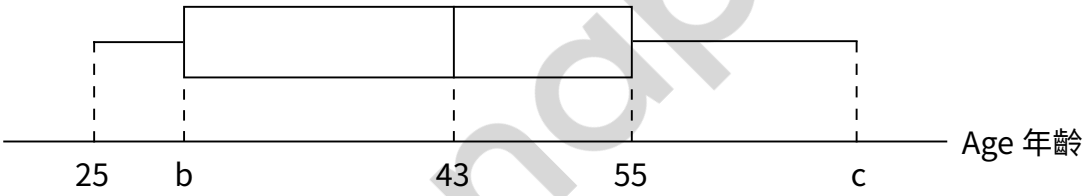

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(i) Write down the greatest possible mode of the distribution.
寫出該分佈最大可取的眾數。

41	45
10th	11th
12th	13th

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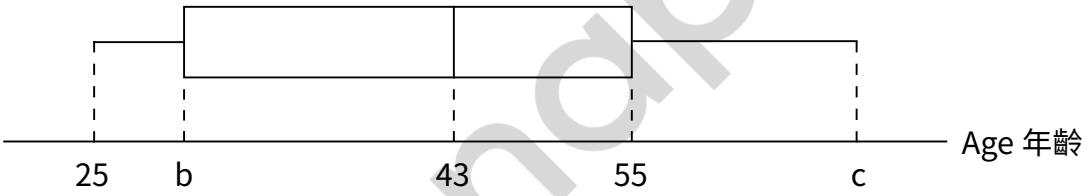

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(ii) Find the least and the greatest possible interquartile range of the distribution.
求該分佈最小以及最大可取的四分位數間距。

k, 42, 44, 65