

29. [Statistics]

Skill 29.1 Calculating the mean of sets of data.

MMMaive 1 1 2 2 3 3 4 4
 MMLime 1 1 2 2 3 3 4 4

Mean (or average)

- Add all the values in the set.
- Divide the total by the number of values in the set.

Set of data: 5, 1, 5, 3, 2, 1, 5, 2

Mean $1 + 1 + 2 + 2 + 3 + 5 + 5 + 5 = 24$
 8 values so $24 \div 8 = 3$

Q. Calculate the mean of the following set of data:
 10, 10, 16, 14, 15

A. $10 + 10 + 16 + 14 + 15 = 65$
 $65 \div 5$
 $= 13$

5 values in the set,
 so divide by 5

a) Calculate the mean of the following set of data:
 6, 22, 21, 14, 18, 15

$6 + 22 + 21 + 14 + 18 + 15 = 96$

$96 \div 6 =$

b) Calculate the mean of the following set of data:
 1, 3, 3, 4, 7, 9, 15

$1 + 3 + 3 + 4 + 7 + 9 + 15 =$

\div

c) Calculate the mean of the following set of data:
 8, 8, 9, 10, 10, 10, 11, 12, 12

.....

d) Calculate the mean of the following set of data:
 2.1, 2.2, 2.2, 2.5, 2.5, 2.5, 2.7, 3.3

.....

e) Complete the set of data so that the mean is 5.

Will be 11 values in the set, so divide by 11

3, 3, 4, 4, 4, 6, 7, 7, 7, 9,

$sum\ of\ all\ terms = 5 \times 11 = 55$

$3 + 3 + 4 + 4 + 4 + 6 + 7 + 7 + 7 + 9 + x = 55$

Solve for x

$54 + x = 55$

$x = 1$

f) Complete the set of data so that the mean is 4.

2, 2, 5, 6,

g) Complete the set of data so that the mean is 10.

8, 8, 9, 10, 11, 13,

h) Complete the set of data so that the mean is 2.

0, 0, 2, 1.5, 1.8, 2, 2.2, 3.5, 4,

Skill 29.2 Calculating the median of sets of data.

Median (middle value)

- Write all the values in order.
- Odd numbered set - middle value.
- Even numbered set - average of the 2 middle values.

Set of data (even): 5, 1, 5, 3, 2, 1, 5, 2

Ordered set: 1, 1, 2, 2, 3, 5, 5, 5

Median = $\frac{2+3}{2} = \frac{5}{2} = 2.5$

Q. Calculate the median of the following set of data: **A.** 1, 2, 2, 3, 3, 3, 4, 4, 6, 8, 8, 9 *order values*

Median: $\frac{3+4}{2} = \frac{7}{2} = 3.5$ *find middle value*

a) Calculate the median of this set of data:

3, 4, 8, 5, 2, 4, 3, 6, 7

order values

find middle value

2, 3, 3, 4, 4, 5, 6, 7, 8

9 values so 5th value is the middle

4

b) Calculate the median of this set of data:

1, 3, 4, 4, 5, 2, 6, 1, 7, 9, 4

.....
.....
.....

c) Calculate the median of this set of data:

1.2, 4.1, 3.2, 3, 4.1, 2.3, 2, 3.1, 2

.....
.....
.....

d) Calculate the median of this set of data:

5, 2, 3, 7, 8, 4, 6, 4

.....
.....
.....

e) Calculate the mean and median of the following set of data:

12, 12, 11, 10, 11, 13, 12, 15, 12

order values

find middle value

10, 11, 11, 12, 12, 12, 12, 13, 15

$10 + 11 + 11 + 12 + 12 + 12 + 12 + 13 + 15 = 108$

$mean = 108 \div 9 = 12$

mean = 12 median = 12

f) Calculate the mean and median of the following set of data:

1, 3, 1, 4, 4, 4, 2, 3, 4, 5, 2, 3

.....
.....
.....

mean = median =

g) Calculate the mean and median of the following set of data:

2, 2, 2, 2.5, 3.5, 3.5, 4, 4.5

.....
.....
.....

mean = median =

h) Calculate the mean and median of the following set of data:

9, 10, 11, 10, 15, 11

.....
.....
.....

mean = median =

Skill 29.3 Calculating the mode and range of sets of data.

Mode (most common value)

Range

- Write all the values in order.
- Subtract the lowest value from the highest value.

Hint: A set of data can have more than one mode if two or more values repeat the same number of times.

Set of data: 5, 1, 5, 3, 2, 1, 5, 2
 Ordered set: 1, 1, 2, 2, 3, 5, 5, 5
Mode 5
Range $5 - 1 = 4$

Q. Calculate the mode and range of the following set of data:

1, 2, 3, 3, 4, 5, 2, 6, 8, 5, 3

A. 1, 2, 2, 3, 3, 3, 4, 5, 5, 6, 8

Mode: 3

Range: $8 - 1 = 7$

order values

The value 3 is in the set 3 times

difference between highest and lowest

a) Calculate the mode of the following set of data:

2, 21, 21, 15, 16, 15, 21

21

The value 21 is in the set 3 times

b) Calculate the mode of the following set of data:

3, 2, 2, 4, 5, 6, 7, 4, 5, 2, 5, 3, 4, 2

c) Calculate the mode of the following set of data:

18, 21, 20, 18, 22, 18, 20, 21, 22

d) Calculate the mode of the following set of data:

102, 99, 98, 100, 101, 98, 102, 98

e) Calculate the range of the following set of data:

12, 14, 16, 14, 15, 13

$16 - 12 =$

f) Calculate the range of the following set of data:

19, 22, 23, 15, 12, 16, 13, 15, 24, 14, 17, 18

g) Calculate the mode and range of the following set of data:

3, 5, 4, 8, 5, 6, 8, 6, 4, 7, 4, 7, 8, 4

mode = range =

h) Calculate the mode and range of the following set of data:

31, 32, 35, 32, 34, 29, 30, 31, 33, 32

mode = range =

i) Calculate the mode and range of the following set of data:

2.8, 3.1, 3.5, 3.6, 3.6, 4, 4.2, 4.5, 4.7, 4.9

mode = range =

j) Calculate the mode and range of the following set of data:

14, 18, 19, 19, 24, 23, 29, 18, 28, 19

mode = range =

Mean (or average)

- Add all the values in the set.
- Divide the total by the number of values in the set.

Median (middle value)

- Write all the values in order.
- Odd numbered set - middle value.
- Even numbered set - average of the 2 middle values.

Mode (most common value)

Set of data: 5, 1, 5, 3, 2, 1, 5, 2

Mean $1 + 1 + 2 + 2 + 3 + 5 + 5 + 5 = 24$
8 values so $24 \div 8 = 3$

Ordered set: 1, 1, 2, 2, 3, 5, 5, 5

Median $= \frac{2+3}{2} = \frac{5}{2} = 2.5$

Mode 5

Q. Which set of data has the same mean, median and mode?

- A) 1, 2, 4, 4, 4, 6, 7
- B) 3, 5, 5, 8, 9
- C) 1, 2, 2, 2, 4, 4, 6

A. A) *Mean* $1 + 2 + 4 + 4 + 4 + 6 + 7 = 28$
 $28 \div 7 = 4$

Median 1, 2, 4, |4, 4, 6, 7 $\Rightarrow 4$

Mode 1, 2, (4), (4), (4), 6, 7 $\Rightarrow 4$

B) *Mean* $3 + 5 + 5 + 8 + 9 = 30$
 $30 \div 5 = 6$

Median 3, 5, |5, 8, 9 $\Rightarrow 5$

Mode 3, (5), (5), 8, 9 $\Rightarrow 5$

C) *Mean* $1 + 2 + 2 + 2 + 4 + 4 + 6 = 21$
 $21 \div 7 = 3$

Median 1, 2, 2, |2, 4, 4, 6 $\Rightarrow 2$

Mode 1, (2), (2), (2), 4, 4, 6 $\Rightarrow 2$

So **A** has the same mean, median and mode.

a) Which set of data has the same mean, median and mode?

- A) -2, 0, 0, 1, 2, 2, 2, 3
- B) 10, 10, 11, 11, 11, 12, 12

.....

.....

b) Which set of data has the same mean, median and mode?

- A) 1, 2, 3, 3, 3, 4, 5
- B) 5, 5, 6, 7, 9, 10

.....

.....

c) Which set of data has the same mean, median and mode?

- A) 8, 8, 9, 10, 11
- B) -1, -1, 1, 1, 1, 3, 3
- C) 2, 3, 3, 4, 5, 7

.....

.....

d) Which set of data has the same mean, median and mode?

- A) 29, 30, 30, 32, 34
- B) 6, 6, 7, 9, 9, 9, 10
- C) -2, 2, 3, 3, 3, 5, 7

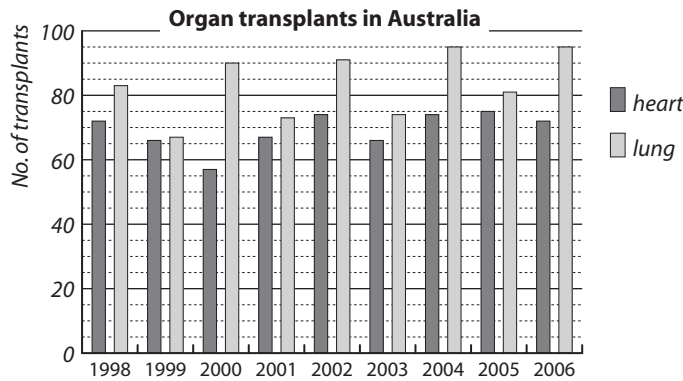
.....

.....

Skill 29.5 Interpreting data in column or bar graphs (1).

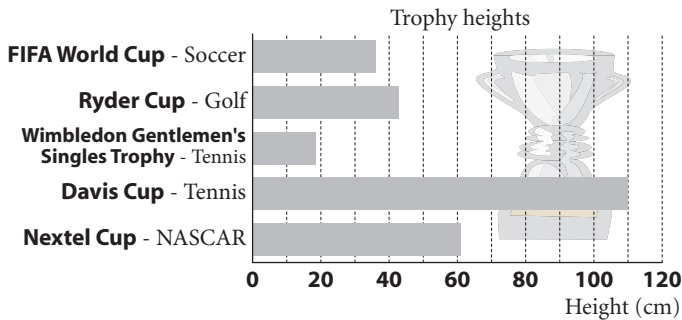
MMMaive 1 1 2 2 3 3 4 4
 MMLime 1 1 2 2 3 3 4 4

Q. In which year were the most heart and lung transplants completed?

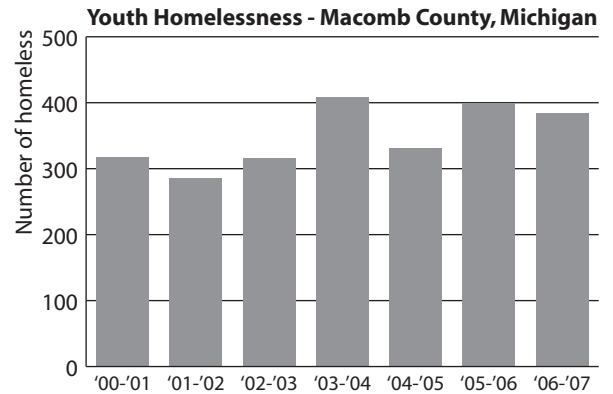


A. Most heart transplants to least -
 2005 ⇒ 75
 2004 & 2002 ⇒ 74
 1998 ⇒ 72
 etc.
 Most lung transplants to least -
 2006 & 2004 ⇒ 95
 2002 ⇒ 91
 2000 ⇒ 90
 etc.
 2002 ⇒ 74 + 91 = 165
 2004 ⇒ 74 + 95 = 169
 The answer is **2004**

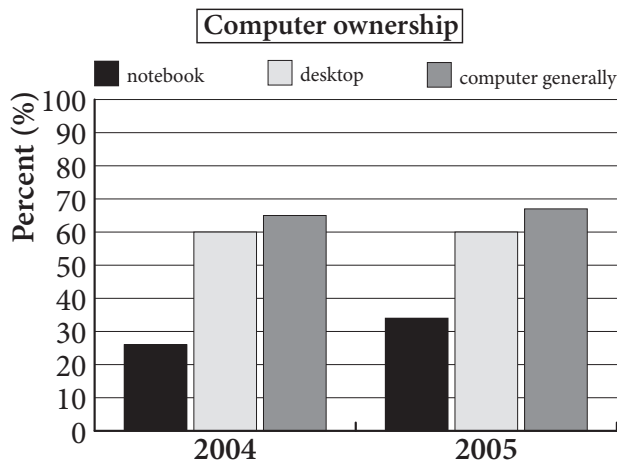
a) Of the trophies listed below, which sport has the 3rd highest trophy?



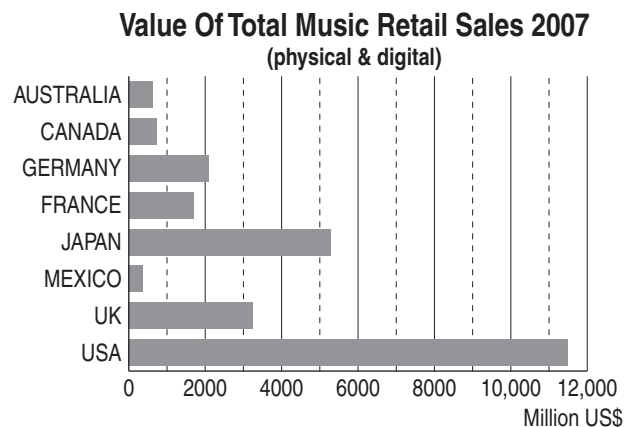
b) In which year span did youth homelessness in Macomb County first reach 400?



c) What percent were notebook owners in 2005? (Give your answer to the nearest 10%.)



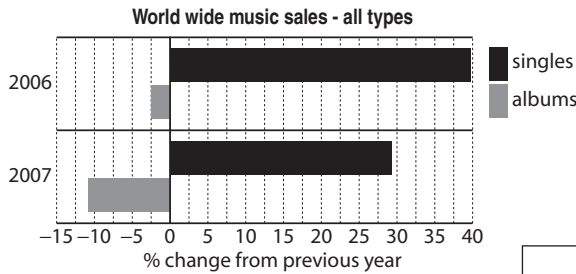
d) How many of the countries listed below had retail music sales in 2007 greater than US\$3000 million?



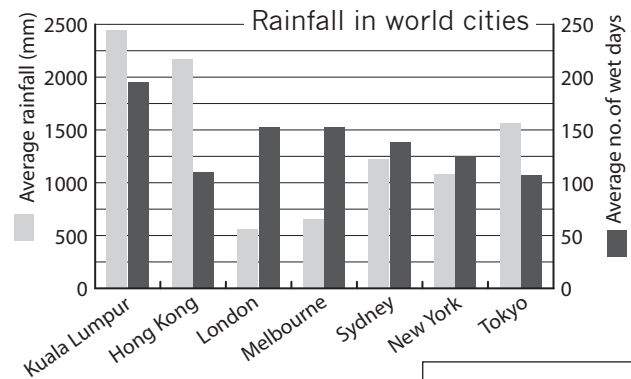
Skill 29.5 Interpreting data in column or bar graphs (2).

MMMaive 1 2 3 3 4 4
MMLime 1 2 2 3 3 4 4

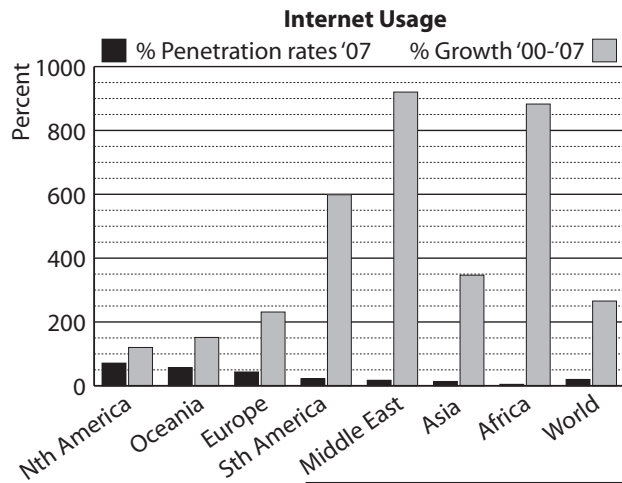
- e) Choose the correct statement:
 A) In 2007 singles sales fell.
 B) In 2007 singles sales grew by approximately 28%
 C) In 2006 album sales grew by 2.5%



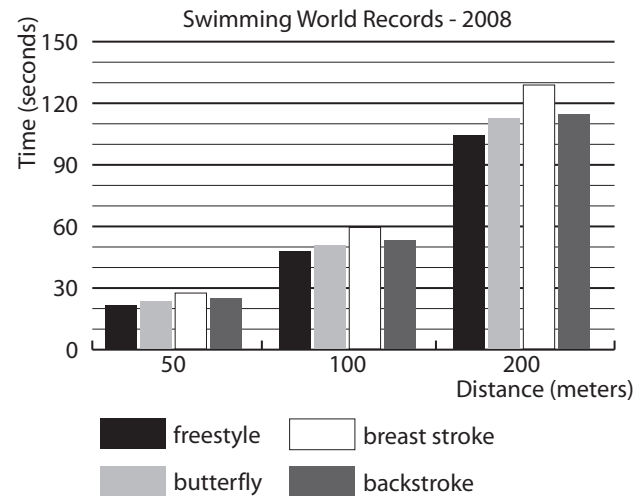
- f) Which city has the most wet days compared to the amount of rainfall?



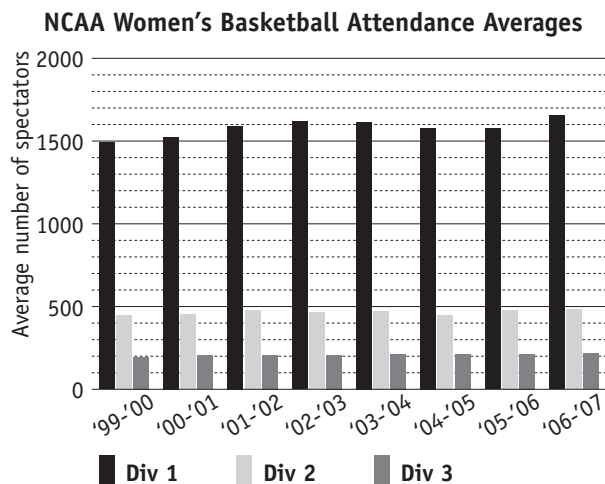
- g) Which region had a 600% growth in internet usage between 2000 and 2007?



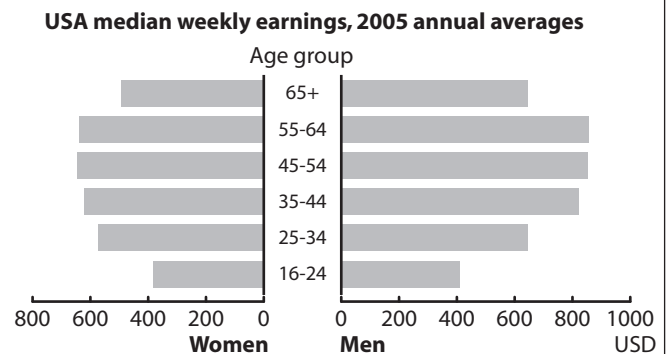
- h) Which swimming stroke is the second fastest?



- i) In which year span did Division 1 basketball attendance first reach 1600 spectators?



- j) In the USA the maximum median weekly earnings for women occur between the ages of 45 and 54 years and are US\$644. In which two age groups do men earn this amount?



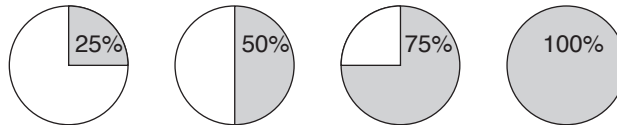
and

Skill 29.6 Interpreting data in circle graphs.

- Consider each section of the circle graph as a sector of the circle.

Hint: Each sector of the circle represents a percent of the total.

Example:

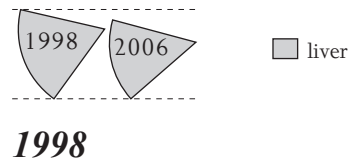


- Q.** Which of the years shown had the largest proportion of liver transplants?

Patient transplants by organ

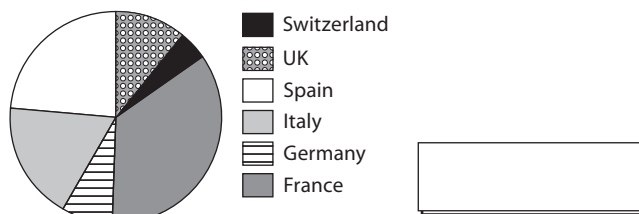


- A.** Compare the relative sizes of the sectors of the circles for both years.



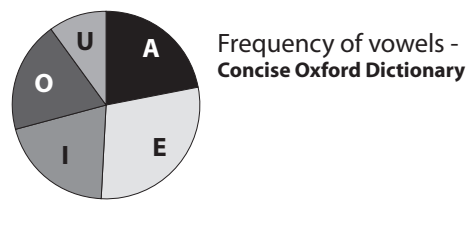
- a)** Of the European countries listed below, which had the third highest number of international tourist arrivals?

International tourist arrivals



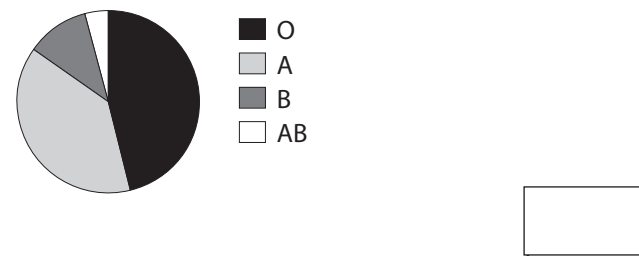
- b)** In the Concise Oxford Dictionary, is the chance of a vowel being a “U” closest to:

A) 5% B) 10% C) 15% D) 25%?



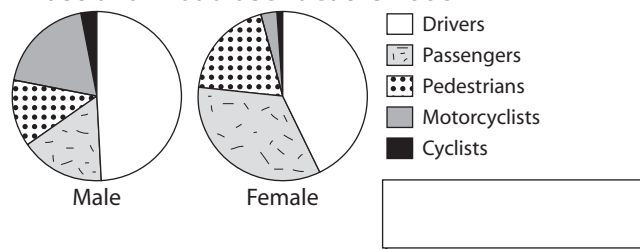
- c)** Which blood type accounts for closest to 10% of the population?

Who has which Blood Type?



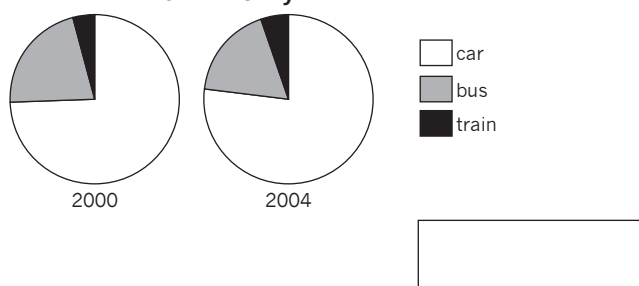
- d)** Which group of road users had the highest proportion of female deaths relative to male deaths in 2006?

Australian road user deaths 2006



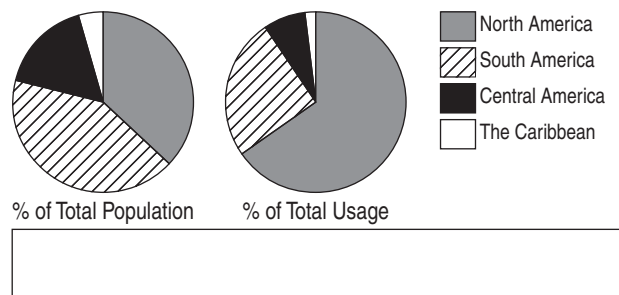
- e)** Which means of travel to the Grand Canyon had a percent decrease from 2000 to 2004?

Travel to the Grand Canyon National Park



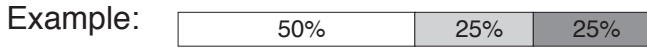
- f)** Which part of the Americas has the highest percent of internet usage relative to its population?

Americas' Internet Users - 2007

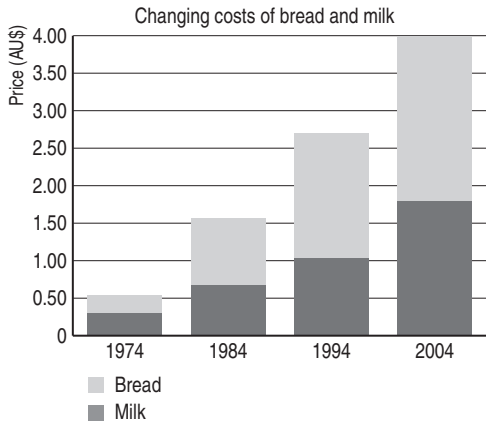


Skill 29.7 Interpreting data in stack graphs.

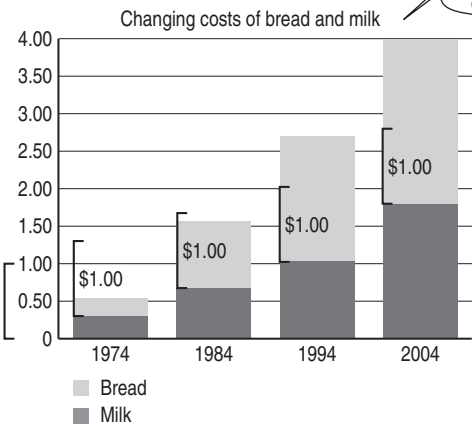
- Read such that each piece of the bar represents a percent or proportion of the total.



Q. In which of the years shown was the price of bread in Australia closest to AU\$1.00?

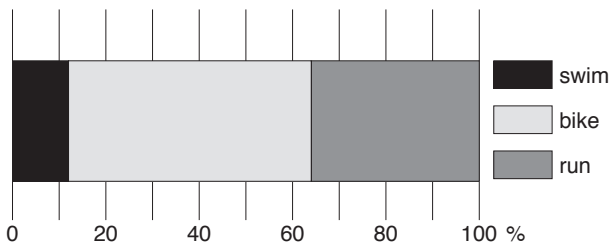


A. 1984

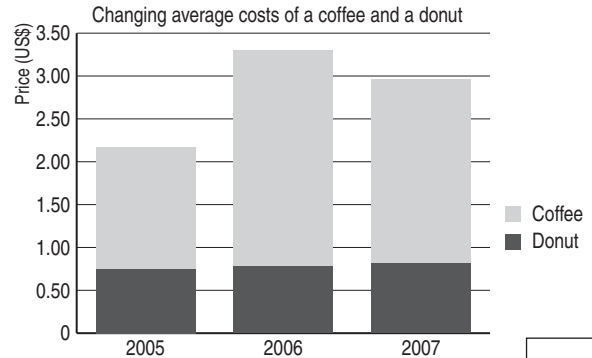


a) Which two activities make up less than half of the Ironman's race time?

2006 Hawaii Ironman
1st place: Norman Stadler (GER)



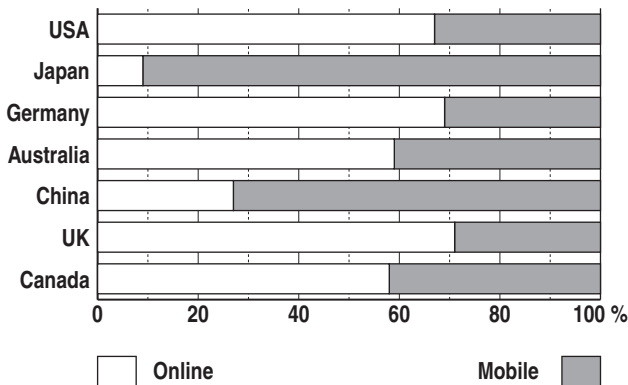
b) In which of the years shown was the average cost of a coffee in the USA closest to US\$2.15?



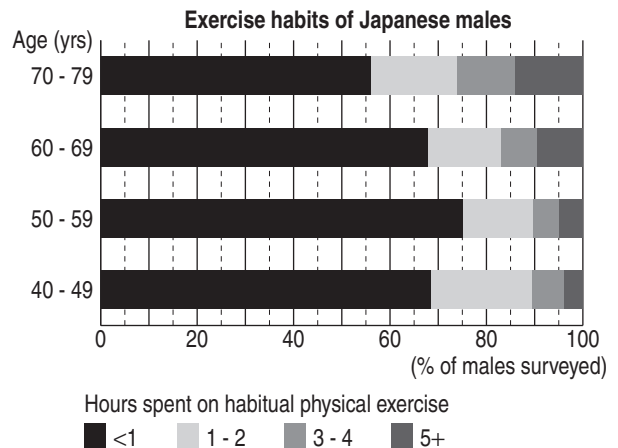
and

c) In which country do mobile sales comprise approximately 73% of digital sales?

Digital Music Markets - Sales by channel

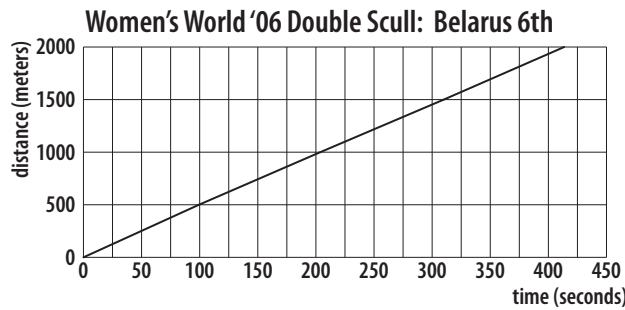


d) In which age bracket did the highest percent of respondents spend 3 to 4 hours on habitual physical exercise?

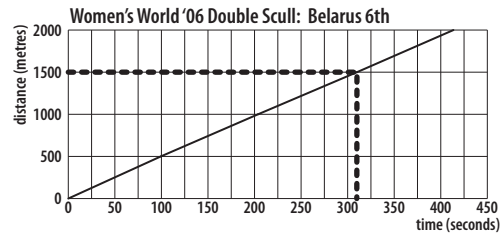


Skill 29.8 Interpreting data in line graphs (1).

Q. How far into the race was the Belarus team after 5 minutes and 10 seconds?



A. $5 \text{ mins} + 10 \text{ seconds}$ Convert to seconds
 $= 5 \times 60 + 10$
 $= 310$

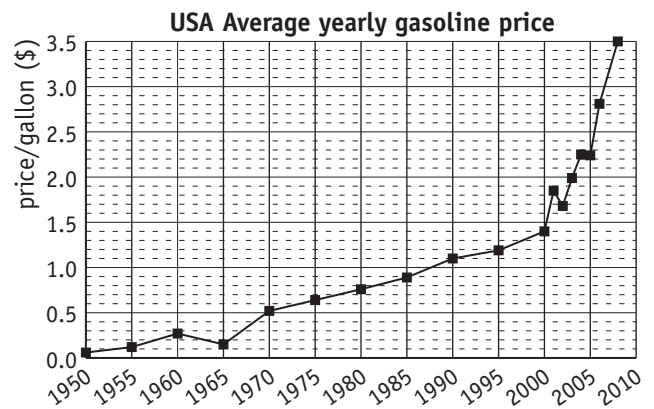


1500 m

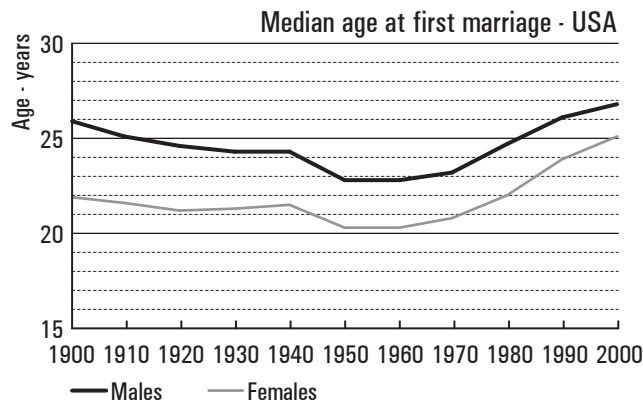
a) In which year between 1979 and 2007 were the highest percent of Australians unemployed?



b) In which year did gasoline prices in the USA average \$1.10?

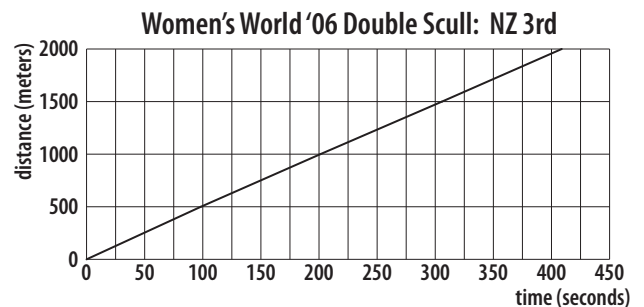


c) In which of the years shown has there been the greatest difference in marrying age of men and women in the USA?



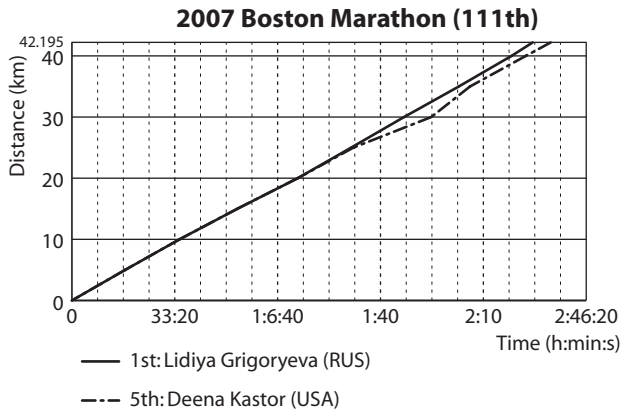
d) At what approximate speed, in m/s, did the New Zealand team row?

A) 0.5 m/s B) 2 m/s C) 5 m/s D) 10 m/s



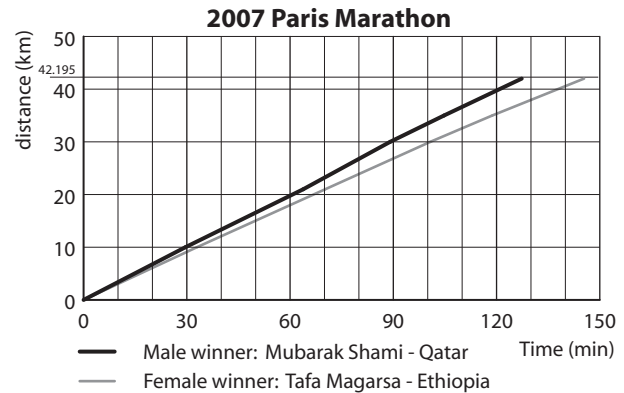
Skill 29.8 Interpreting data in line graphs (2).

e) How far into the marathon was Deena Kastor when she began to recover from stomach cramps?



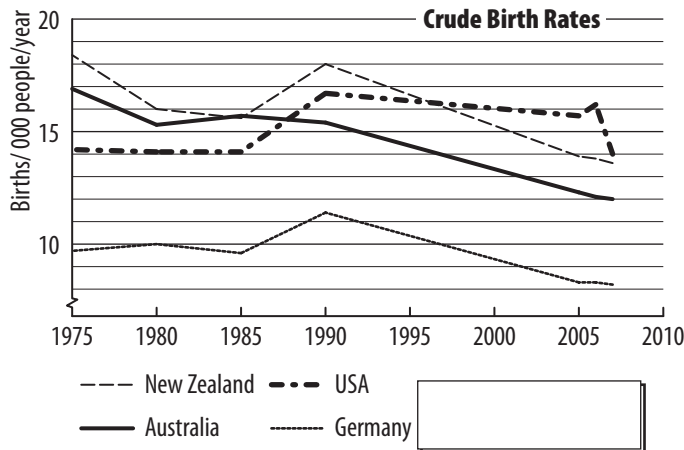
km

f) Approximately how much longer did it take Tafa than Mubarak to reach the 30 km mark of the 2007 Paris marathon?

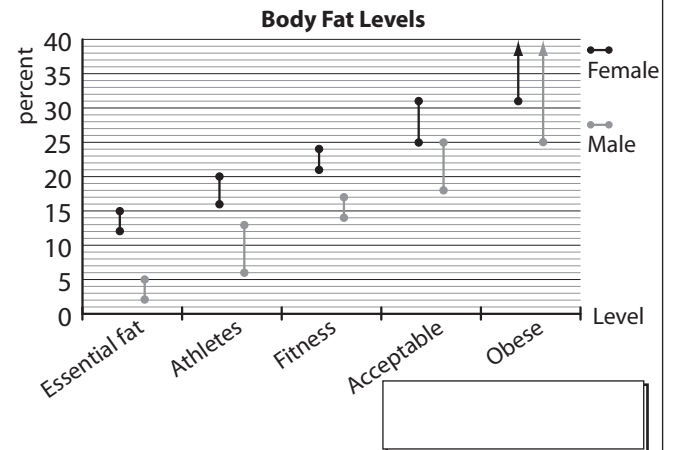


min

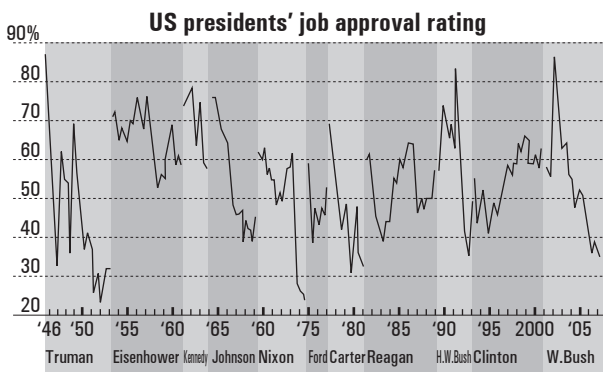
g) During which 5 year interval did Australia's crude birth rate go most against the trend?



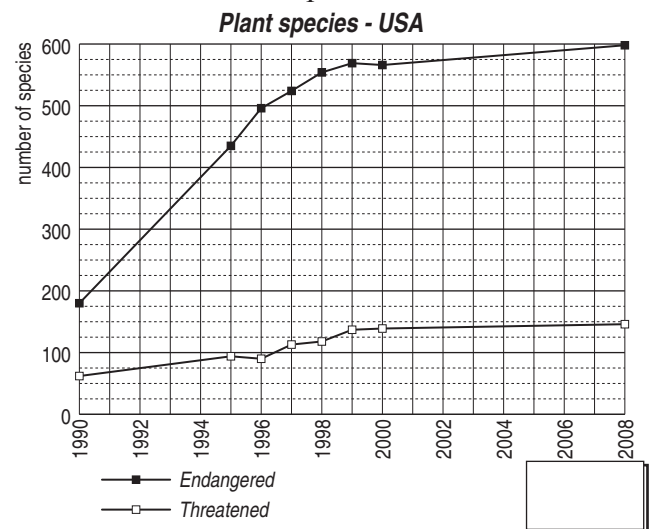
h) According to the step graph, if a man has 15% body fat, which level description does he fit?



i) Which of the US presidents shown had the most inconsistent approval rating during his term of office?



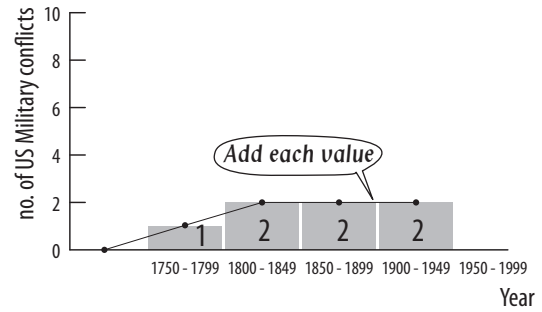
j) In which year, between 1990 and 2008, did the number of threatened species fall?



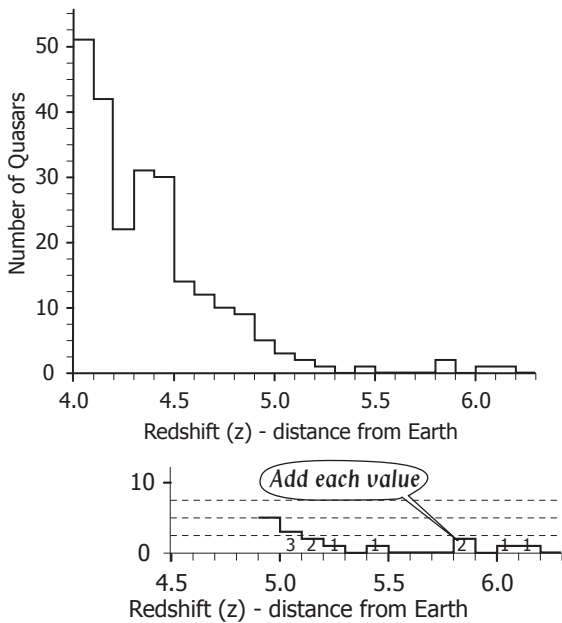
Q. Using the histogram below, how many times did the USA engage in military conflict prior to 1950?



A. $1 + 2 + 2 + 2$
 $= 7$

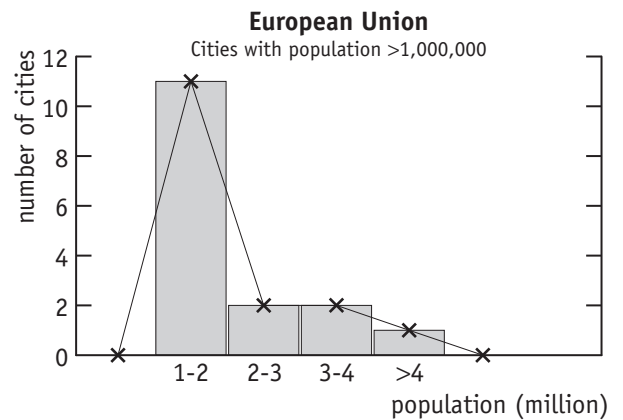


a) How many quasars have been discovered with a redshift of 5 or greater?

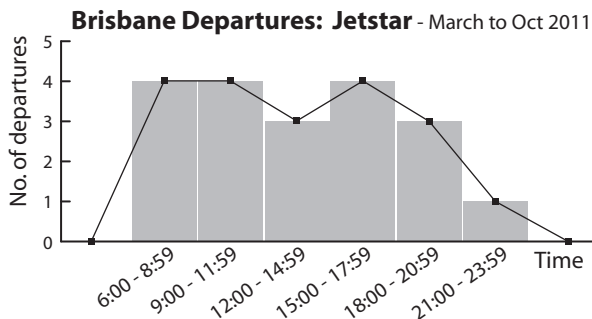


$3 +$

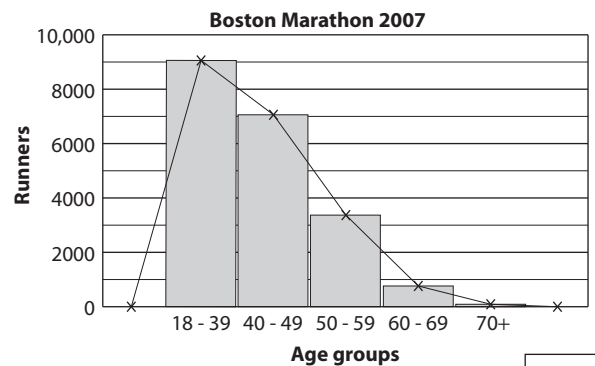
b) How many cities in the European Union have a population greater than 2 million people?



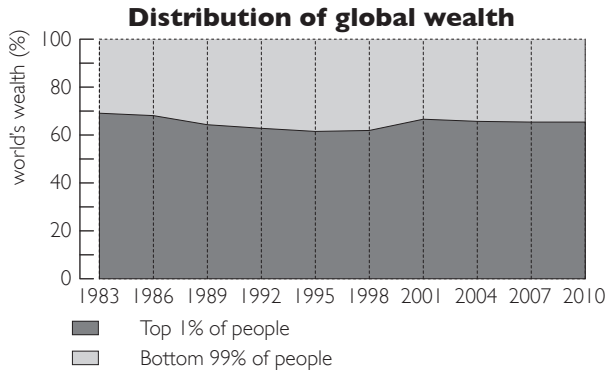
c) In 2011 between March and October how many departures did Jetstar airlines have out of Brisbane (Australia) after 6:00 P.M. each day?



d) The best approximation for the number of runners in the 2007 Boston Marathon is:
A) 15,000 B) 20,000 C) 25,000



Q. During which 3-year period did the percent of wealth held by the world's top 1% of people increase the most?



A. 1998 - 2001

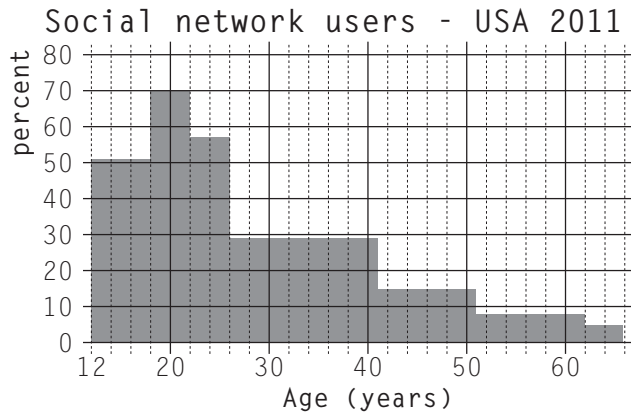
Find the top 1% shaded color.

Observe the increases and decreases.

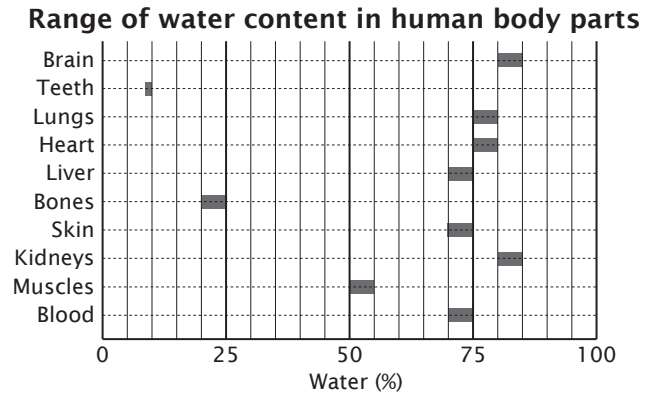
Find the steepest increase.



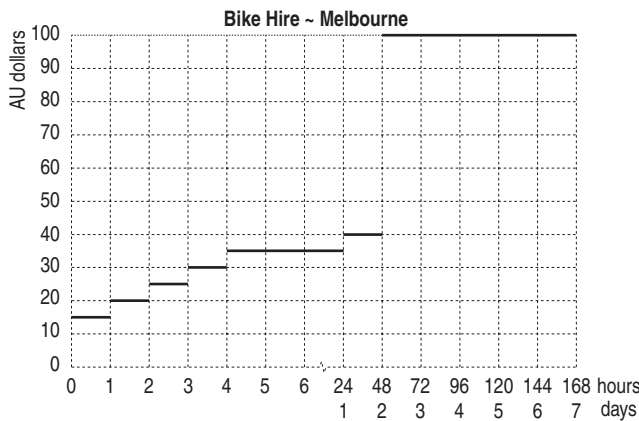
a) What percent of 20 year olds use social network sites in the USA in 2011?



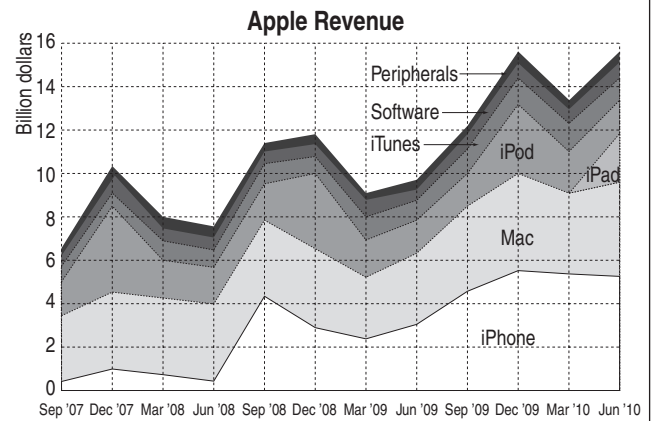
b) Which part of the body is most likely to contain 52% water?



c) Mary hired a bike for 5 hours in Melbourne. How much did she pay?

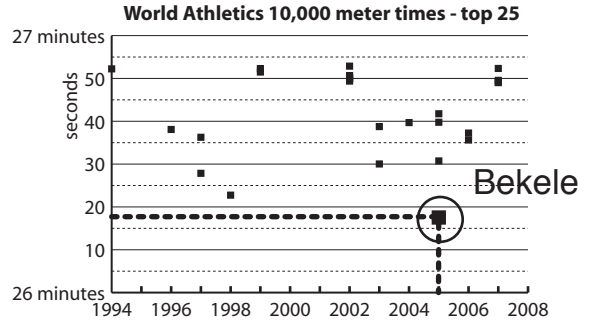
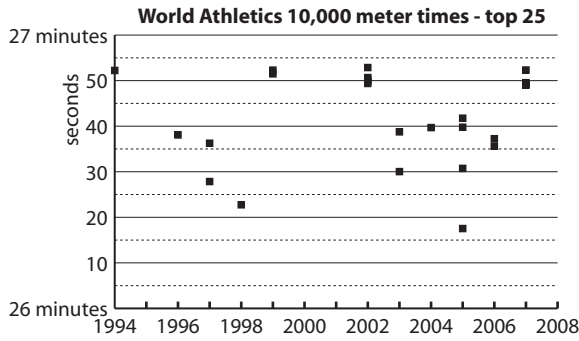


d) In September 2009 which product accounted for approximately one third of Apple's revenue?



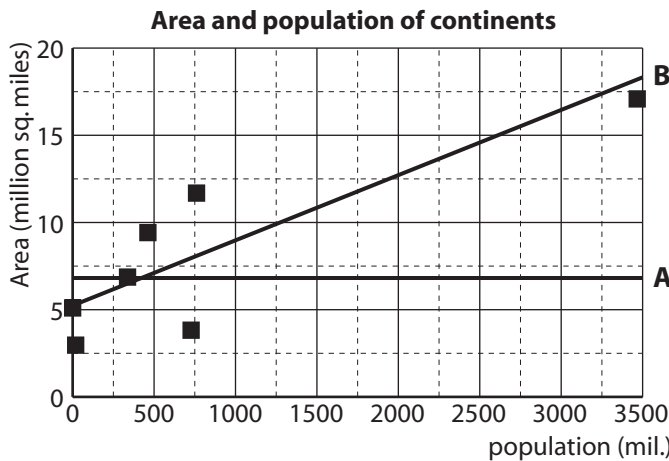
Q. In what year did Bekele (Ethiopia) set the world record time of 26:17.53 for the 10,000 m event?

A. 2005

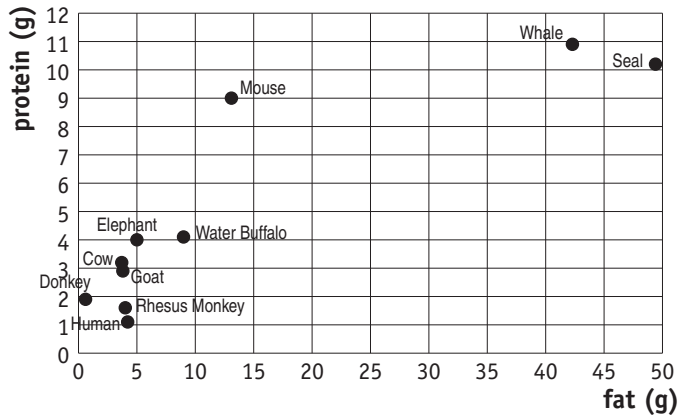


a) Select the most appropriate trend line for this scatter plot. [Hint: The sums of the distances from the points above and below the line, to the line, are approximately equal.]

b) How many of the mammals tested have less than 5 grams of fat and less than 2 grams of protein in any 100 grams of their milk?



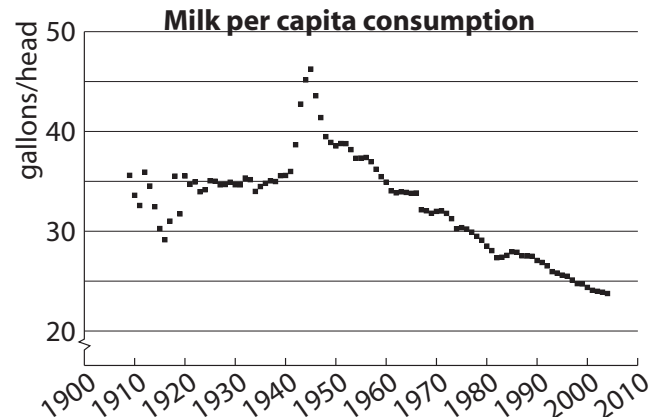
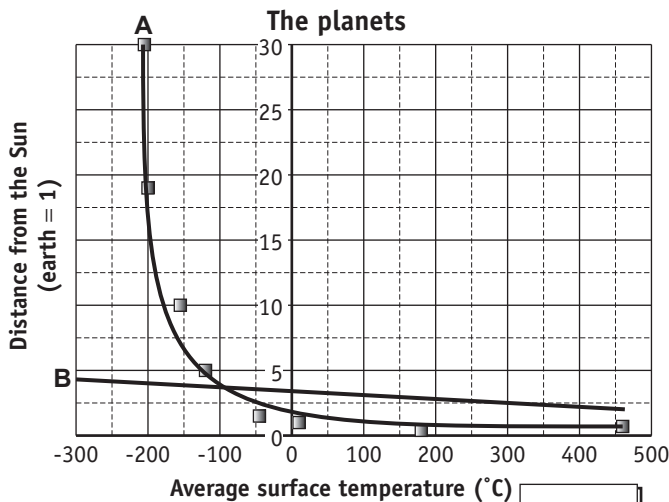
Fat and protein composition of milk from different mammalian species (per 100 g of fresh milk)



c) Select the most appropriate trend line for this scatter plot. [Hint: The sums of the distances from the points above and below the line, to the line, are approximately equal.]

d) The difference in milk consumption between 1960 and 1990 is:

- A) < 5 gallons/head
- B) = 5 gallons/head
- C) > 5 gallons/head



Skill 29.12 Interpreting frequency tables.

MMMaive 11 22 33 44
MMLime 11 22 33 44

- Consider the meaning of mean, median, mode and range as required.
(see skills 29.1 to 29.4, pages 349 to 352)

Q. How many scores of 6 or less are in the following distribution?

Score	5	6	7	8	9
Frequency	3	2	4	3	1

How many times the score occurs

A. There are 2 lots of 6 and 3 lots of 5 scored.
 $2 + 3$
 $= 5$

a) How many scores of more than 13 are in the following distribution?

Score	10	11	12	13	14
Frequency	4	8	3	6	5

14 > 13

b) How many scores of 8 or more are in the following distribution?

Score	4	6	8	10	12
Frequency	3	7	1	4	5

c) Find the median and range of the following distribution.

Score	15	16	17	18	19
Frequency	3	5	2	7	3

20 scores

$$\text{median} = \frac{17 + 18}{2} = \frac{35}{2} = 17.5$$

$$\text{range} = 19 - 15 = 4$$

median = range =

d) Find the mean and mode of the following distribution.

Score	2	3	4	5	6
Frequency	4	2	1	1	2

10 scores

$$\text{mean} = \frac{2 \times 4 + 3 \times 2 + 4 \times 1 + 5 \times 1 + 6 \times 2}{10} = \frac{35}{10}$$

mode =

mean = mode =

e) Find the median and range of the following distribution.

Score	0	1	2	3	4
Frequency	5	11	6	14	5

median =

range =

median = range =

f) Find the mean and mode of the following distribution.

Score	0	1	2	3	4
Frequency	4	6	5	3	2

mean =

mode =

mean = mode =

Skill 29.13 Interpreting stem-and-leaf plots (1).

To complete a stem-and-leaf plot from a given set of data:

- Write the values from the data set - each unit digit is a leaf beside its corresponding tens (or hundreds) digit, which is a stem.

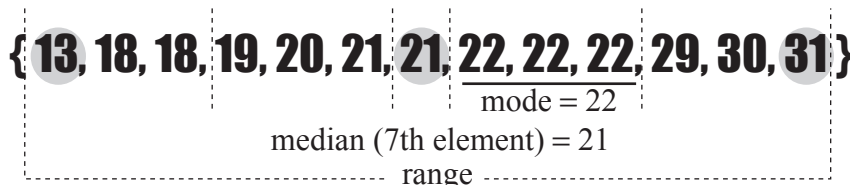
Hint:

tens value	units value	
STEM	LEAF	
0	2	= 2
1	5 7	= 15 and 17

hundreds & tens values	units value	
STEM	LEAF	
23	7	= 237

To calculate values from a stem-and-leaf plot:

Data set of 13 elements:



Mode (most common value)

- Find the leaf digit that repeats most.
- Read the number resulting from the corresponding stem and leaf.

Median (middle value)

- Count the number of leaves.
- If an odd number of leaves:
 - Count from the top left leaf until you reach the middle leaf.
 - This digit is the unit and must be put with the corresponding stem.

If an even number of leaves:

- Count from the top left leaf until you reach the two middle leaves.
- Read the digits with their corresponding stems.
- Find the average of the 2 middle numbers.

stem	leaves	lowest value = 13
1	3 8 8 9	median = 21
2	0 1 1 2 2 2 9	mode = 22
3	0 1	highest value = 31

range = high - low
= 31 - 13
= 18

mean = $286 \div 13$
= 22

Range

- Subtract the lowest number (top left leaf) from the highest number (bottom right leaf).

Q. This back-to-back stemplot shows the sets of points scored in the 2007 season by the New York Giants and the New York Jets. Find the difference between the medians of the two sets of data, showing the scores of weeks 1 to 17.

New York Giants		New York Jets
	0	3 3 6 9
7 6 6 6 3 3 0	1	0 3 3 4 4 8 9
	2	0 4
4 1 0	3	1 1
8 5 5 5 3 1	4	0

middle leaves

A. 16 scores for each team \Rightarrow
median = average of 8th and 9th scores

New York Giants:
median = $\frac{20 + 21}{2} = \frac{41}{2} = 20.5$

New York Jets:
median = $\frac{14 + 14}{2} = \frac{28}{2} = 14$

difference = $20.5 - 14 = 6.5$

a) Complete the stem-and-leaf plot for this data:
3, 12, 16, 17, 20, 21, 32, 35, 35, 37, 39, 43, 48

stem	leaves
0	3
1	2 6 7
2	0 1
3	— — — — —
4	— —

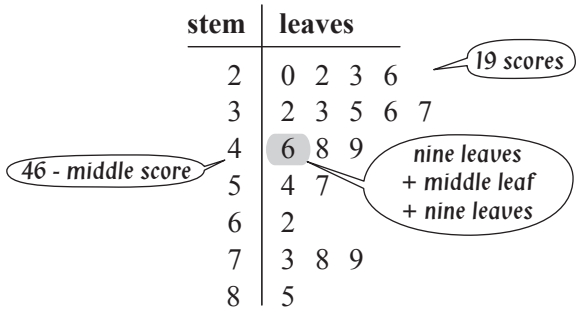
b) Complete the stem-and-leaf plot for this data:
202, 204, 207, 210, 223, 223, 226, 228, 229, 230, 231, 232, 236

stem	leaves
20	— — —
21	—
22	— — — — —
23	— — — — —

Skill 29.13 Interpreting stem-and-leaf plots (2).

MMMaive 1 1 2 2 3 3 4 4
MMLime 1 1 2 2 3 3 4 4

- c)** Find the median and range of this set of data representing the set of scores obtained by a Math class.

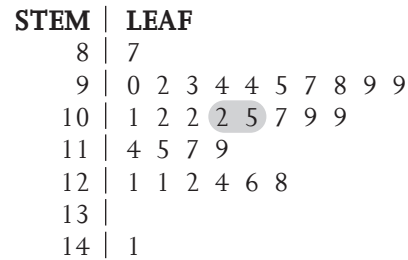


median =

range = $85 - 20 =$

median =	range =
----------	---------

- d)** Find the median and mode of this set of data representing the IQ scores for 30 year 10 students.



median = = =

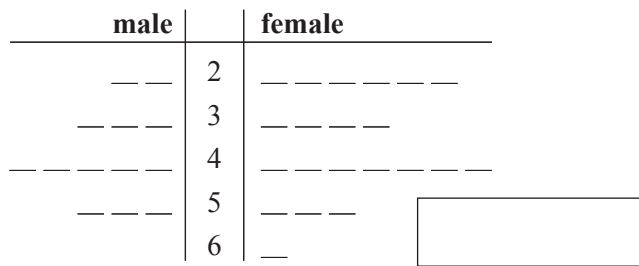
mode =

median =	mode =
----------	--------

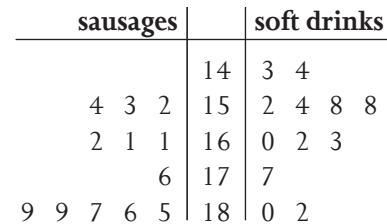
- e)** Complete the back-to-back stem-and-leaf plot for the following two sets of data representing the ages of the teachers at the local middle school. Find which set has the greater median.

Male: 27, 28, 33, 36, 39, 40, 47, 47, 48, 49, 50, 52, 55

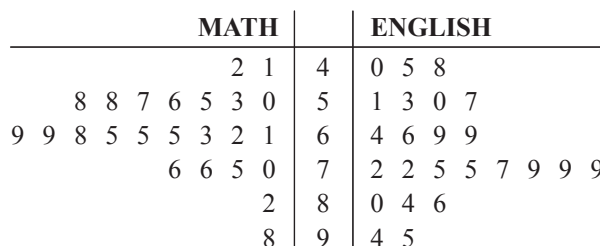
Female: 22, 23, 26, 27, 29, 29, 34, 36, 38, 38, 41, 43, 44, 44, 45, 48, 49, 50, 56, 59, 61



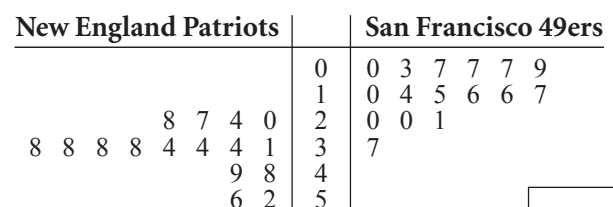
- f)** This back-to-back stemplot shows the numbers of sausages and soft drinks sold at the school fundraisers in one year. Find the difference between the medians of the two sets of data.



- g)** The back-to-back stemplot below shows the English and Math scores of a year 10 class. Find the difference between the medians of the two sets of scores.



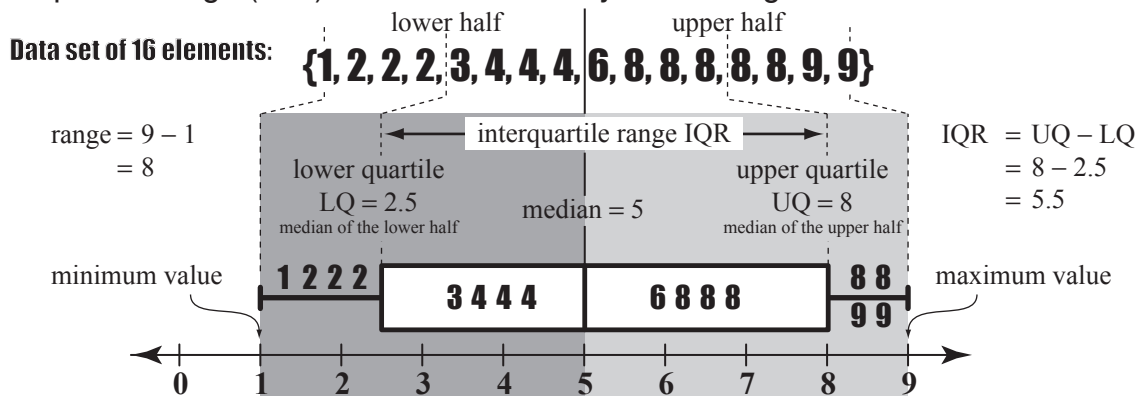
- h)** This back-to-back stemplot shows the sets of points scored in the 2007 season by the New England Patriots and the San Francisco 49ers. Find the difference between the medians of the two sets of data, showing the scores of weeks 1 to 17.



Skill 29.14 Calculating the upper quartile (UQ), lower quartile (LQ) and interquartile range (IQR) for box-and-whisker plots, frequency tables and stem-and-leaf plots (1).

- Find the median or middle value of the set of data.
- Divide the data into an upper half and a lower half.
- Find the median of the upper values of the set of data, or the upper quartile (UQ).
- Find the median of the lower values of the set of data, or the lower quartile (LQ).
- Find the interquartile range (IQR) of the set of data by subtracting the LQ from the UQ.

Example:



Q. Calculate the median and upper quartile (UQ) for the data displayed in this frequency table.

Athens, 2004 - bronze medal winning countries

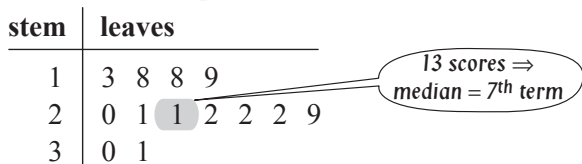
Number of medals	1	2	3	4	5	6	7	8	9	10
Frequency	15	13	7	6	2	2	1	0	4	0

scores 1 to 15 are all 1 scores 16 to 28 are all 2

A. 50 scores all together \Rightarrow
 median = average of 25th and 26th scores } \Rightarrow
 25th and 26th scores are 2
 median = 2

UQ is the median of the 25 upper scores \Rightarrow
 UQ = 13th score counting from the top score:
 9, 9, 9, 9, 7, 6, 6, 5, 5, 4, 4, 4, 4 \Rightarrow
 UQ = 4 (13th score from the top)

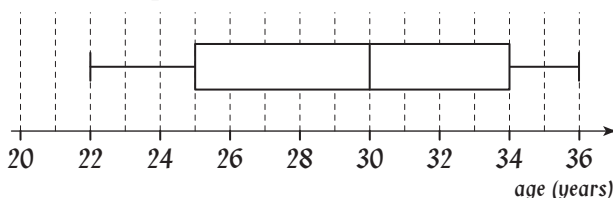
a) For this stem-and-leaf plot, find the median and the lower quartile (LQ).



$$LQ = \frac{18 + 19}{2} = \frac{37}{2} =$$

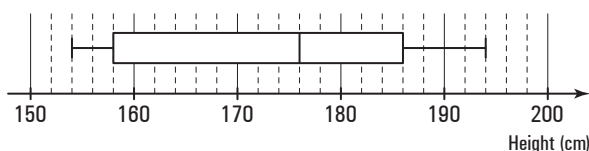
median = LQ =

b) For this box-and-whisker plot, find the median and lower quartile (LQ).



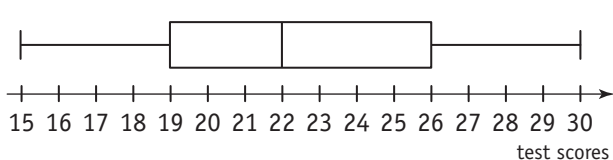
median = LQ =

c) For this box-and-whisker plot, find the median and upper quartile (UQ).



median = UQ =

d) For this box-and-whisker plot, find the lower quartile (LQ) and upper quartile (UQ).

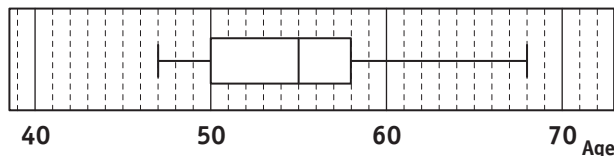


LQ = UQ =

Skill 29.14 Calculating the upper quartile (UQ), lower quartile (LQ) and interquartile range (IQR) for box-and-whisker plots, frequency tables and stem-and-leaf plots (2).

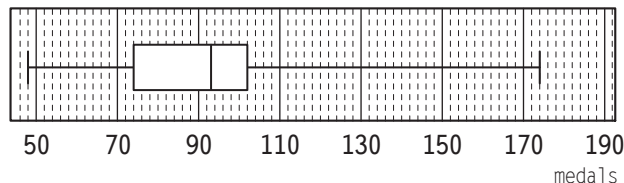
MMMauve 11 22 33 44
MMLime 11 22 33 44

- e) What is the median and upper quartile (UQ) of the set of ages of the 19th century American presidents when they were first elected?



median = UQ =

- f) What is the median and interquartile range (IQR) of the number of medals won by the USA at each of the Olympics between 1908 and 2004, as shown on this boxplot?



median = IQR =

- g) Calculate the median and lower quartile (LQ) for the data displayed in this frequency table.

Athens, 2004 - silver medal winning countries

Number of medals	1	2	3	4	5	6	7	8	9	10
Frequency	15	11	6	5	2	4	1	0	4	0

median = LQ =

- h) Calculate the median and upper quartile (UQ) for the data displayed in this frequency table.

Adam Scott - PGA, 2006

rounds 72 or less

Score	63	64	65	66	67	68	69	70	71	72
Frequency	1	1	4	4	5	5	11	7	11	9

median = UQ =

- i) Calculate the median and upper quartile (UQ) for the data displayed in this frequency table.

Score	20	21	22	23	24	25	26	27	28	29
Frequency	5	2	8	0	3	7	9	1	6	2

median = UQ =

- j) Calculate the median and lower quartile (LQ) for the data displayed in this frequency table.

Score	5	6	7	8	9	10	11	12	13	14
Frequency	2	3	1	4	0	10	5	0	12	3

median = LQ =

- k) Find the interquartile range (IQR) for the set of data shown in this stem-and-leaf plot.

STEM	LEAF
1	1 1 2 3 4 4
1	7 8 9
2	0 2 2 4
2	5 5 6 8 9
3	0 1 2 2 3 4
3	6 6 7 8 9
4	1 1 2 3 3 4

IQR =

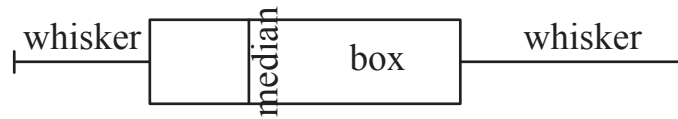
- l) This stem-and-leaf plot shows the ages of the 19th century American presidents when they were first elected. Find the interquartile range (IQR) for the set of data.

STEM	LEAF
4	7 8 9
5	0 0 0 1 2 2 4
5	5 5 6 7 8 8 8 9
6	2
6	5 6 8

IQR =

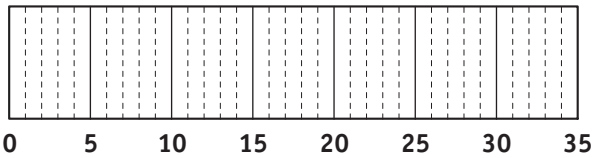
Skill 29.15 Drawing box-and-whisker plots.

- Order the given data set.
- Find the median, lowest and greatest values, lower quartile and upper quartile.
- Mark the maximum and minimum values with whiskers.
- Mark the median of all values with a vertical line.
- Mark the upper quartile and lower quartile with the box edges as shown below.



Q. Draw a box-and-whisker plot for the set of data:

7, 8, 13, 15, 20, 22, 24, 27, 30, 32



A. (7), 8, 13, 15, 20, 22, 24, 27, 30, (32)

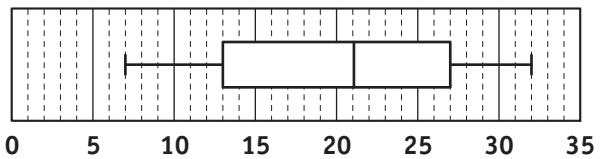
maximum value = 32

minimum value = 7

median = $\frac{22+20}{2} = 21$

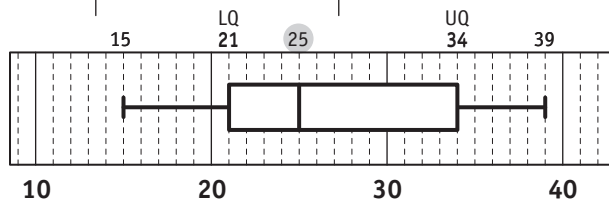
upper quartile = 27 (median of upper values)

lower quartile = 13 (median of lower values)



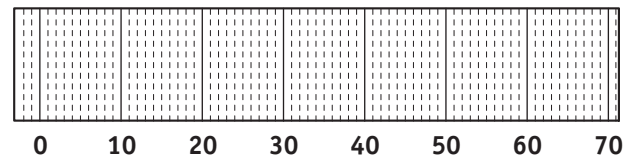
a) Draw a box-and-whisker plot for the set of data:

15, 21, 21, 23, 25, 27, 32, 36, 39



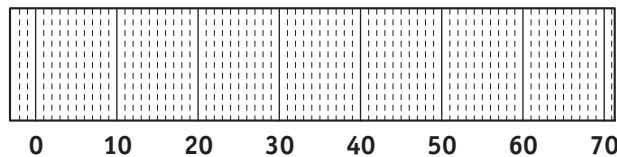
b) Draw a box-and-whisker plot for the set of data:

34, 47, 11, 15, 57, 24, 20, 11, 19, 50, 28, 37

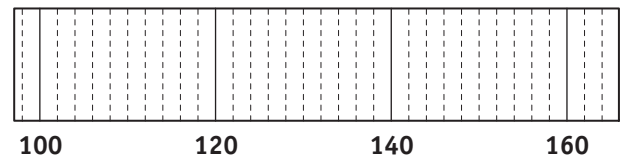


c) Draw a box-and-whisker plot for the set of data:

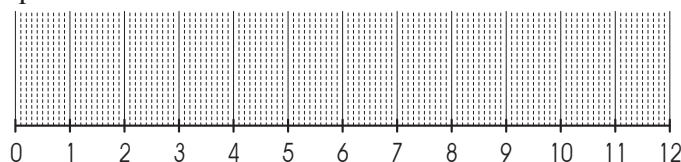
51, 17, 25, 39, 7, 49, 62, 41, 20, 6, 43, 13



d) Draw a box-and-whisker plot for the set of data whose lowest value is 104, greatest value is 158, median is 136, lower quartile is 116 and upper quartile is 142.



e) Draw a box-and-whisker plot for the set of data whose lowest value is 0, greatest value is 11.8, median is 4.1, lower quartile is 1.2 and upper quartile is 8.5



f) Draw a box-and-whisker plot for the set of data whose lowest value is 15, greatest value is 60, median is 35, lower quartile is 25 and upper quartile is 40.

