

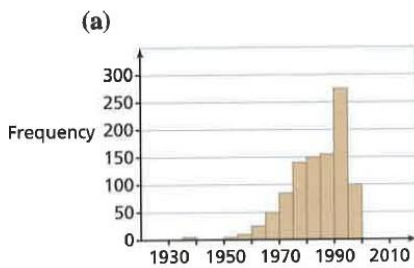
## Section 3.1 Worksheet – Shapes of Distributions

MDM4U

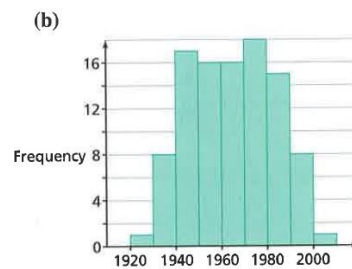
David Chen

1) Match the following distribution curves to the random variables listed below. Also, describe the shape of the distribution.

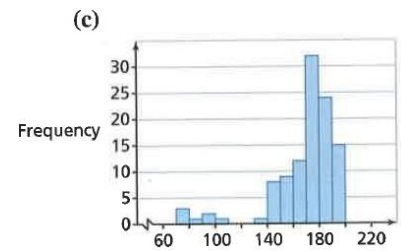
- i) cost of the “cheap seats” at 30 baseball stadiums
- ii) bowling scores
- iii) the gestation period in days of various animals
- iv) the year shown on a penny
- v) the production year of the American Film Institute’s top 100 films
- vi) amounts shown on an electric bill



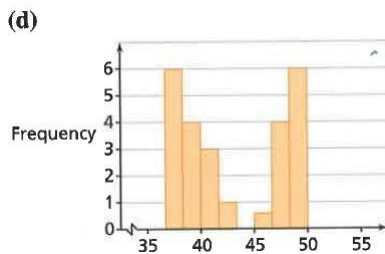
*iv) year shown on a penny  
skewed left*



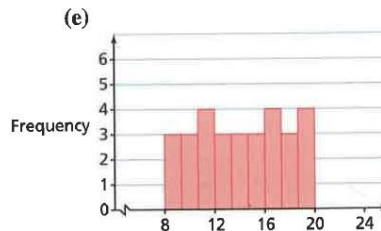
*v) year of top 100 films  
mound shaped*



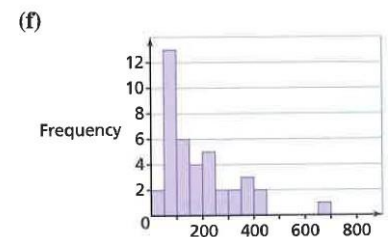
*ii) bowling scores  
skewed left*



*vi) amount of electric bill  
bimodal (u-shaped)*



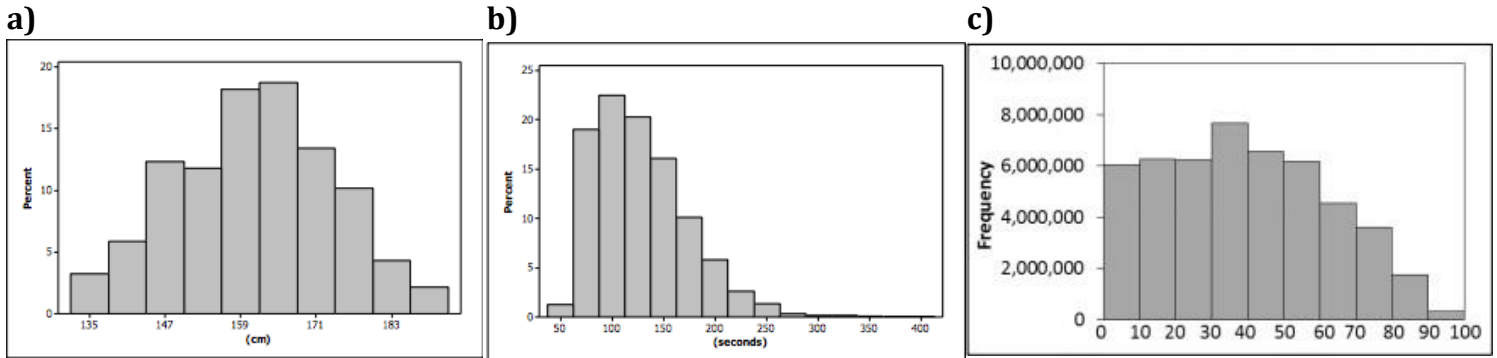
*i) the cost of cheap seats  
uniform*



*iii) gestation period  
skewed right*

**2)** Match the following distribution curves to the random variables listed below. Also, describe the shape of the distribution.

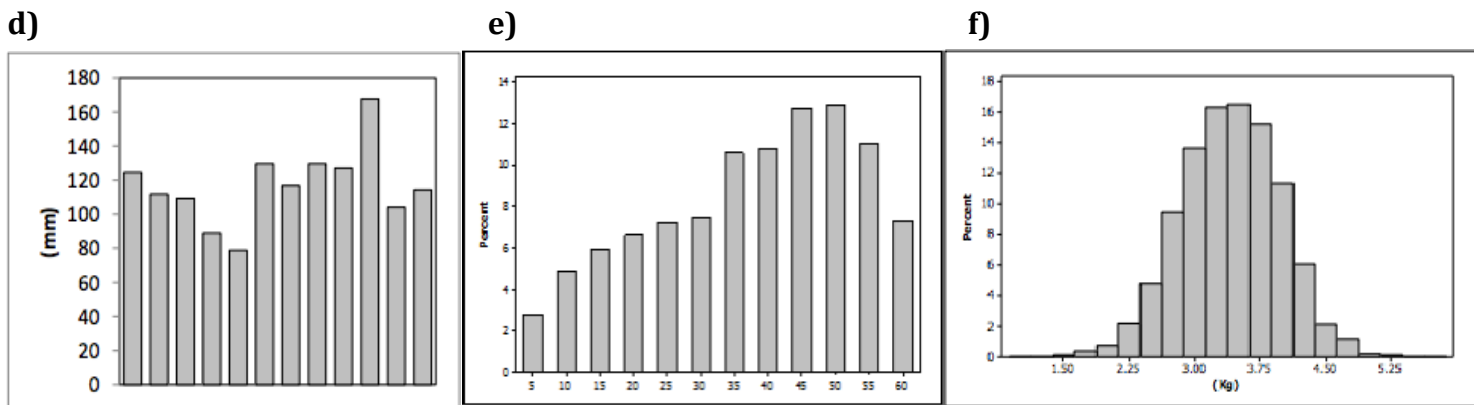
- i) Population by age for England (2011 census)
- ii) Average rainfall per month for Bermuda
- iii) Time taken by students to complete an online quiz
- iv) Weight of new-born babies
- v) Children's heights
- vi) Student scores for a 12 question quiz (5 marks for each correct answer)



*v) children's heights  
mound shaped*

*iii) time taken for quiz  
rights skewed*

*i) population by age  
right skewed*



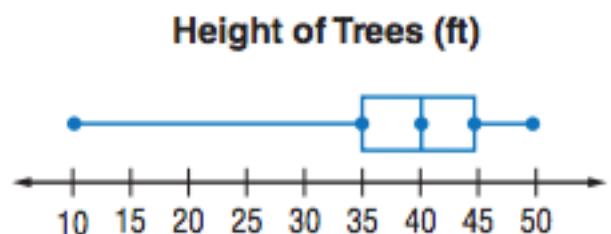
*ii) average rainfall  
approximately uniform*

*vi) quiz scores  
left skewed*

*iv) weight of babies  
mound shaped*

**3)** The box and whisker plot shows the heights in feet of several trees. Is the distribution skewed left or right? Explain.

*Skewed left. 75% of the data is clustered on the right side (between 35 and 50). Only 25% of the data is on the left (between 10 and 35)*



4) Using the following data:

13, 7, 5, 7, 9, 10, 5, 11, 8, 7, 9, 10, 10, 11, 14, 10, 6, 9, 7, 12, 9, 10, 6

a) Calculate a bin width that would form five uniform intervals

$$\text{Range} = 14 - 5 = 9 \quad \text{Bin Width} = \frac{10}{5} = 2$$

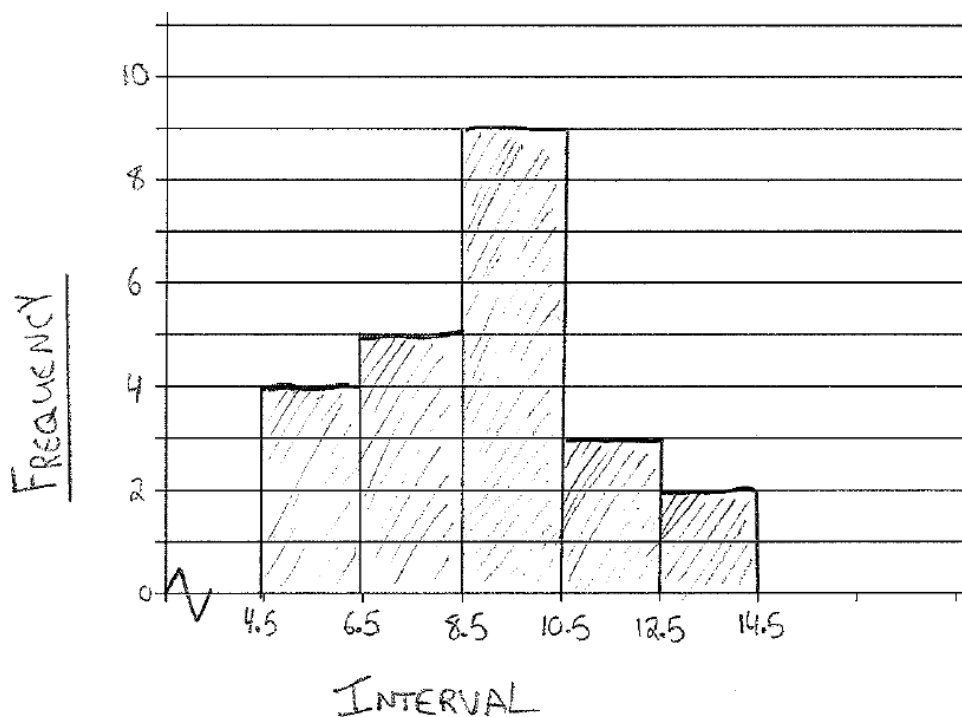
b) Calculate the starting and end point for each of the five intervals. Then complete the frequency distribution.

*Rounded range up by 1 from 9 to 10. Subtract  $\frac{1}{2} = 0.5$  from lowest value to determine starting point.*

$$\text{Starting point} = 5 - 0.5 = 4.5$$

Interval	Frequency
4.5 – 6.5	4
6.5 – 8.5	5
8.5 – 10.5	9
10.5 – 12.5	3
12.5 – 14.5	2

c) Create an appropriate histogram.



5) The following data represent salaries, in thousands of dollars, for employees of a small company. Notice the data have been sorted in increasing order.

24, 25, 25, 27, 27, 29, 30, 35, 35, 35, 36, 38, 38  
 39, 39, 40, 40, 40, 45, 45, 45, 45, 47, 52, 52, 52  
 58, 59, 59, 61, 61, 67, 68, 68, 68, 70

a) Calculate a bin width that would form five uniform intervals

$$\text{Range} = 70 - 24 = 46$$

$$\text{Bin Width} = \frac{50}{5} = 10$$

b) Calculate the starting and end point for each of the five intervals. Then complete the frequency distribution.

*Rounded range up by 4 from 46 to 50. Subtract  $\frac{4}{2} = 2$  from lowest value to determine starting point.*

$$\text{Starting point} = 24 - 2 = 22$$

*Also subtract 0.5 to make sure no data falls on a boundary.*

$$\text{Starting point} = 22 - 0.5 = 21.5$$

Salary Interval	Frequency
21.5 – 31.5	7
31.5 – 41.5	11
41.5 – 51.5	5
51.5 – 61.5	8
61.5 – 71.5	5

c) Create an appropriate histogram.

