

11.2
1. Read page 624. What is the difference between discrete random variable and continuous random variables?

DRV: exact values, whole #s

CRV: continuous, not exact values ex. age

A group of students measured the lengths of their pencils accurate to the nearest tenth of a centimeter. Here are the results.

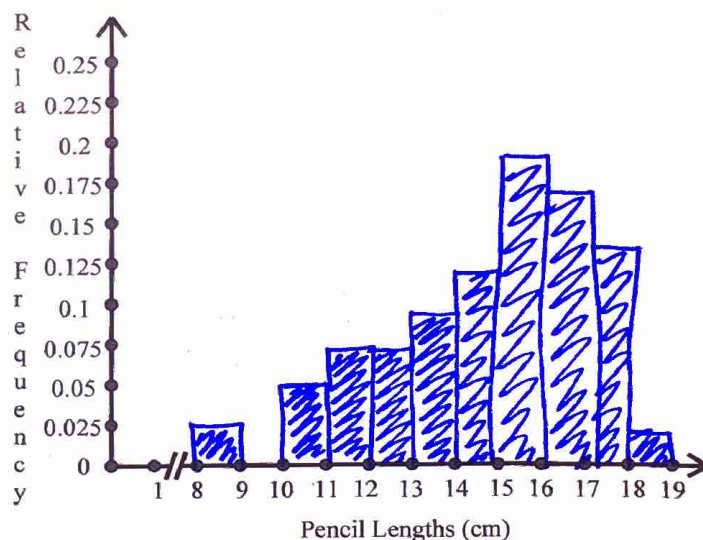
relative freq.
= $\frac{\text{freq.}}{\text{\# data pts}}$

16.9	18.7	11.3	13.8	15.2	17	16.5	16.6	11.8	17.2
15.5	15.7	17	11.4	16.5	16	13.4	15.7	15.5	14.1
12.3	13.8	15.5	15.7	15.2	15.6	12.1	14.4	16.5	17.9
8.2	17.8	17.6	14.1	16.7	14.6	12.3	16.6	13.2	14.3

2. Complete the frequency table.

Bin	Frequency	Relative Frequency
8-9cm	1	$\frac{1}{40} = 0.025$
9-10cm	0	$\frac{0}{40} = 0$
10-11cm	2	$\frac{2}{40} = 0.05$
11-12cm	3	$\frac{3}{40} = 0.075$
12-13cm	3	$\frac{3}{40} = 0.075$
13-14cm	4	$\frac{4}{40} = 0.1$
14-15cm	5	$\frac{5}{40} = 0.125$
15-16cm	8	$\frac{8}{40} = 0.2$
16-17cm	7	$\frac{7}{40} = 0.175$
17-18cm	6	$\frac{6}{40} = 0.15$
18-19cm	1	$\frac{1}{40} = 0.025$

3. Divide the number of pencils in each bin by the total number of pencils. Make a new histogram, using these quotients as the values on the y-axis. This is called a relative frequency histogram.



same interval

$\rightarrow = 1$

4. Verify that the area of the histogram on the right is 1. Why must this be true?

$\frac{40}{40} = 1$ 100% of data

Using your relative frequency histogram, find the probability that the length of a selected pencil is:

5. Less than 12 cm

8-9, 9-10, 10-11, 11-12
 $0.025 + 0 + 0.05 + 0.075$

$= 0.15$
15%

6. Between 12 and 16 cm

12-13, 13-14, 14-15, 15-16
 $.075 + 0.1 + 0.125 + 0.2$

$= 0.5$
50%

7. Greater than 16 cm

16-17, 17-18, 18-19

$= 0.35$
35%

Example A

A random-number generator selects a number between 0 and 6 according to the probability distribution at right. Because the random number can be any value of x with $0 \leq x \leq 6$, the graph is a continuous graph.

Find the probability that a selected number is

a. Less than 2.

$$\text{Area} = 2(.2) = 0.4$$

40%

b. Between 2.5 and 3.5.

$$\text{Area} = 1(.2) = 0.2$$

20%

c. More than 4.

$$\text{Area} = \frac{1}{2} (2)(.2) = 0.2$$

20%

Find each of the following for the probability distribution.

d. Mode the highest point's x-value
(the x-value of the maximum)

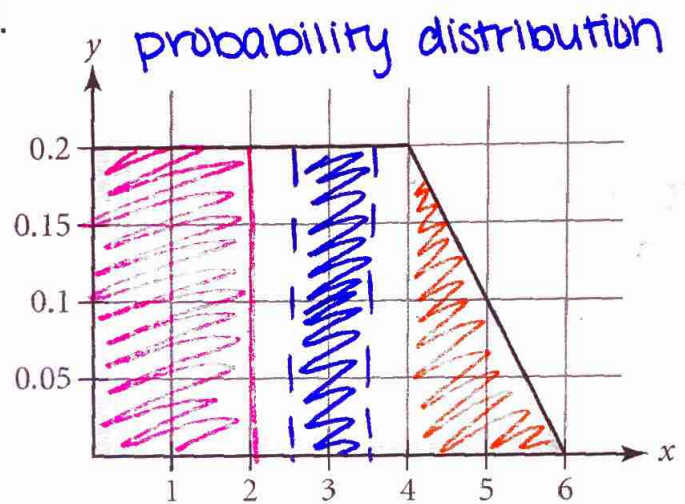
no mode because no 1 max. point

e. Median the x-value that splits the area in $\frac{1}{2}$

$$0.5 = l(w)$$

$$0.5 = l(.2)$$

$$\text{2.5} = l$$



TOTAL area of the shape

A = rectangle + triangle

$$A = l(w) + \frac{1}{2}(b)(h)$$

$$A = 4(.2) + \frac{1}{2}(2)(.2)$$

$$A = 1$$

* should always be 1*