

You will not receive full credit if you do not clearly show work as demonstrated in class. Show all work in the space provided on this exam. Circle your answers.

1. A random sample of ten trees is selected from the population of trees in a particular forest. These trees are then tested to determine their ages. The ages of the ten trees (in years) are:

45, 61, 62, 54, 52, 25, 43, 50, 44, 54

- a. Calculate the median for this data. (5 points)

~~25, 43, 44, 45, 50, 52, 54, 54, 61, 62~~

$$MD = \frac{50 + 52}{2} = \frac{102}{2} = 51 \text{ years}$$

- b. Calculate the sample mean for this data. (5 points)

$$\Sigma X = 25 + 43 + 44 + 45 + 50 + 52 + 54 + 54 + 61 + 62 = 490$$

$$\bar{X} = \frac{\Sigma X}{n} = \frac{490}{10} = 49 \text{ years}$$

- c. Calculate the midrange for this data. (4 points)

$$MR = \frac{\text{lowest value} + \text{highest value}}{2} = \frac{25 + 62}{2} = \frac{87}{2} = 43.5 \text{ years}$$

- d. Find the mode for this data. (If there is no mode then write *no mode*.) (4 points)

The mode is 54 years since 54 occurs more often than any other value.

- e. Calculate the sample variance for this data. (8 points)

From **part a**, $\Sigma X = 490$.

$$\Sigma X^2 = (25)^2 + (43)^2 + (44)^2 + (45)^2 + (50)^2 + (52)^2 + (54)^2 + (54)^2 + (61)^2 + (62)^2 = 25,036$$

$$s^2 = \frac{n(\Sigma X^2) - (\Sigma X)^2}{n(n-1)} = \frac{10(25,036) - (490)^2}{10(10-1)} = \frac{250,360 - 240,100}{10(9)} = \frac{10,260}{90} = 114 \text{ years}^2$$

1. Continued from the previous page. (Data: 45, 61, 62, 54, 52, 25, 43, 50, 44, 54)

f. Calculate the sample standard deviation for this data. (2 points)

$$s = \sqrt{s^2} = \sqrt{114} \approx 10.7 \text{ years}$$

g. Calculate the range for this data. (4 points)

$$R = \text{highest value} - \text{lowest value} = 62 - 25 = 37 \text{ years}$$

h. Complete the frequency table below. (28 points)

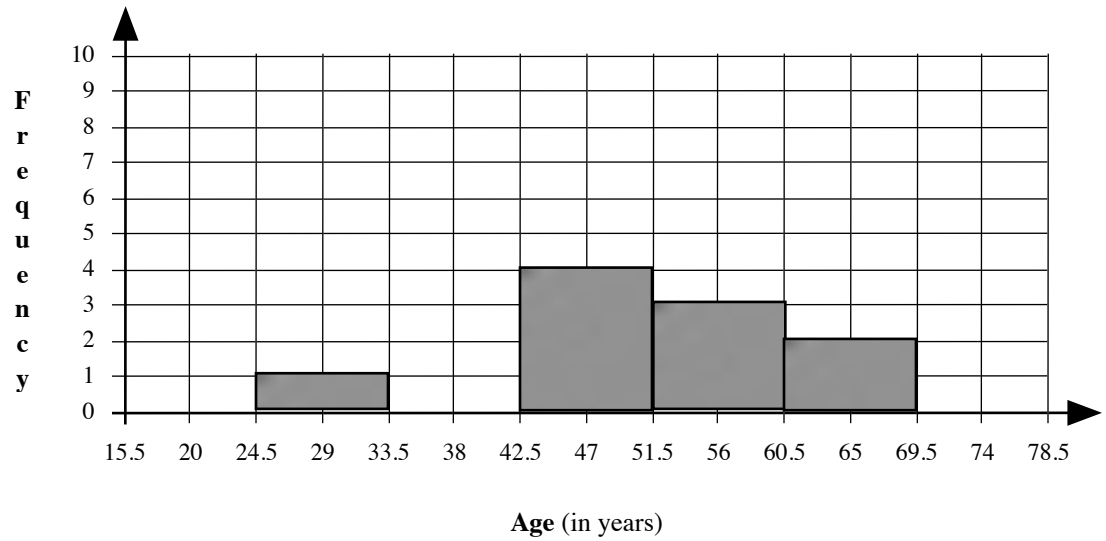
<u>Class Limits</u>	<u>Class Boundaries</u>	<u>Class Midpoint</u>	<u>Tally</u>	<u>Frequency</u>	<u>Cumulative Frequency</u>
16-24	<u>15.5</u> - <u>24.5</u>	<u>20</u>	_____	<u>0</u>	<u>0</u>
25-33	<u>24.5</u> - <u>33.5</u>	<u>29</u>	_____	<u>1</u>	<u>1</u>
34-42	<u>33.5</u> - <u>42.5</u>	<u>38</u>	_____	<u>0</u>	<u>1</u>
43-51	<u>42.5</u> - <u>51.5</u>	<u>47</u>	_____	<u>4</u>	<u>5</u>
52-60	<u>51.5</u> - <u>60.5</u>	<u>56</u>	_____	<u>3</u>	<u>8</u>
61-69	<u>60.5</u> - <u>69.5</u>	<u>65</u>	_____	<u>2</u>	<u>10</u>
70-78	<u>69.5</u> - <u>78.5</u>	<u>74</u>	_____	<u>0</u>	<u>10</u>

i. Finish labeling the units on the horizontal axis, and plot the ogive for this data. (12 points)



1. Continued from the previous page. (Data: 45, 61, 62, 54, 52, 25, 43, 50, 44, 54)

j. Finish labeling the units on the horizontal axis, and plot the histogram for this data. (10 points)



k. Finish labeling the units on the horizontal axis, and plot the frequency polygon for this data. (14 points)



l. Calculate the coefficient of variation for this data. (4 points)

$$CVar = \frac{s}{\bar{X}} \cdot 100\% = \frac{10.7}{49} \cdot 100\% \approx 21.8\%$$