

Math 160  
 Professor Busken  
 Measures of Center

Name: Key

For questions 1—7, use the *sample data* given below. Environmental scientists measured the greenhouse gas emissions of a sample of cars. The amounts listed below are in tons (per year), expressed as CO<sub>2</sub> equivalents.

7.2 7.1 7.4 7.9 6.5 7.2 8.2 9.3  
 6.5 7.1 7.2 7.2 7.4 7.9 8.2 9.3

1. What is the variable,  $x$ , being measured in this sample? 1.) gas emissions (in tons)
2. Determine the value of  $\sum x = 7.2 + 7.1 + 7.4 + 7.9 + 6.5$  2. 60.8
3. Determine the value of  $\bar{x}$ .  $\bar{x} = \frac{\sum x}{n} = \frac{60.8}{8}$  3. 7.6
4. What is the median value of data set? 4. 7.3
5. Is there a mode? If so what is its value? 5. 7.2
6. What is the midrange value of data set?  $\frac{\max + \min}{2} = \frac{6.5 + 9.3}{2}$  6. 7.9
7. Are there any outlier values in the given data set? 7. no

For questions 8—14, use the *sample data* given below. The data is from a simple random sample of space shuttle flight duration times (in hours).

73 95 235 192 165 262 191 376 259 235 381 331 221 244 0  
 0 73 95 165 191 192 221 235 235 244 259 262 331 376 381

8. What is the variable,  $x$ , being measured in this sample?
9. Determine the value of  $\sum x$ . 9. 3260
10. Determine the value of  $\bar{x} = \frac{\sum x}{n} = \frac{3260}{15} \approx 217.3$  10. 217.3
11. What is the median value of data set? 11. 235
12. Is there a mode? If so what is its value? 12. 235
13. What is the midrange value of data set?  $\frac{\max + \min}{2} = \frac{381 + 0}{2} = 190.5$  13. 190.5

use  
 sort  
 on  
 calculator

(14) 0 is an outlier

(15) b) has a mode 9

(16) Use  $\bar{x} \approx \frac{\sum f \cdot x}{\sum f}$ , where  $x$  is the class midpoint, and  $f$  is a class frequency

class	X class midpoint	f frequency	X · f
1	2.0	3	6.0
2	2.2	3	6.6
3	2.4	3	7.2
4	2.6	7	18.2
5	2.8	7	19.6
6	3.0	4	12
7	3.2	2	6.4
8	3.4	1	3.4
$\sum f = 30$			$\sum f \cdot x = 79.4$

we sum the entries of this last column to get  $\sum f \cdot x$ .

Then the sample average,  $\bar{x}$ , is approximated by

$$\frac{\sum f \cdot x}{\sum f} = \frac{79.4}{30} = 2.64\bar{6}$$

(17)

	w (weights)	x exam, quiz	w · x
participation	3% = 0.03	87 scores	2.61 %
Homework	5% = 0.05	77	3.85 %
Quizzes	17% = 0.17	71	12.07 %
Exams	50% = 0.50	78	39 %
Final	25% = 0.25	58	14.5 %
	$\Sigma w = 1$		$\Sigma w \cdot x = 72.03\%$

Use the weighted mean formula,  $\bar{x} = \frac{\Sigma w \cdot x}{\Sigma w}$ , where the

weights, w, are the amounts (percentages) of the overall grade as decimals; and x is the variable representing the exam, quiz, hw, participation, and final exam scores.

Answer 72.03%

(18)

	w	x	w · x	
Participation	3% = 0.03	93%	2.79 %	Let u represent the unknown test score (final)
hw	0.05	86%	4.3 %	
Quizzes	0.17	83%	14.11 %	
exams	0.50	91%	45.5 %	
Final	0.25	unknown	0.25u	
	$\Sigma w = 1$		$\Sigma w \cdot x = 0.25u + 66.7$	

Now set  $\frac{\Sigma w \cdot x}{\Sigma w}$  equal to the desired grade, 92.5, and solve for u.

$$0.25u + 66.7 = 92.5$$

$$0.25u = 92.5 - 66.7$$

$$0.25u = 25.8$$

$$u = \frac{25.8}{0.25} = 103.2\%$$

It is not possible for Jamie to get an A in the class