

Instructions: Read the instructions on each problem carefully. Complete all parts of the problem. On some problems you will be asked to show work by hand. In general, problems beginning with fractions should end with them; problems beginning with decimals should end with them. Round only when instructed to do so, except when working with money: in that case, round to the nearest penny.

1. Consider the list of exam scores from a certain algebra class.

~~69, 73, 57, 86, 68, 69, 59, 91, 55, 87, 108, 89, 88, 75, 76, 70, 91, 73~~

- a. Find the mean of the exam grades. (8 points) $n = 18$

$$\frac{1384}{18} \approx 76.89$$

- b. Find the median of the exam grades. (10 points)

~~55, 57, 59, 68, 69, 69, 70, 73, 73, 75, 76, 81, 87, 88, 89, 91, 91, 108~~

74

- c. Find the mode of the exam grades. (You may report up to two modes, but if there are three, report "no mode".) (8 points)

no mode (3 values are repeated: 73, 69, 91)

2. Suppose you have a jar containing 5 green marbles, 7 blue ones, 11 red ones and 2 white marbles. Use this information to answer the following questions.

- a. How many marbles are in the jar? (5 points)

25

- b. What is the probability of pulling a blue marble from the jar? (7 points)

$\frac{7}{25}$

- c. What is the probability of pulling first a blue marble from the jar, and without putting it back, then pulling a white marble from the jar? (8 points)

$$\frac{7}{25} \cdot \frac{24}{24-1} = \frac{7}{300}$$

- d. What is the probability of selecting either a green or a red marble on the first try? (8 points)

$$\frac{11}{25} + \frac{5}{25} = \frac{16}{25}$$

3. Five sample values are given below.

11, 7, 5, 6, 9

- a. Find the mean of the numbers. (5 points)

$$\frac{38}{5} = 7.6$$

- b. Find the variance of the data. (12 points)

$$11 - 7.6 = 3.4 \Rightarrow 11.56$$

$$7 - 7.6 = -0.6 \Rightarrow 0.36$$

$$5 - 7.6 = -2.6 \Rightarrow 6.76$$

$$6 - 7.6 = -1.6 \Rightarrow 2.56$$

$$9 - 7.6 = 1.4 \Rightarrow 1.96$$

$$+ \frac{23.2}{4} =$$

$$\frac{\sum (x_d - \bar{x})^2}{n-1}$$

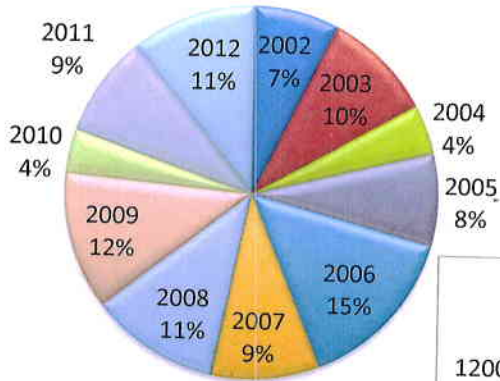
$$\text{var} = s^2 = 5.8$$

- c. Find the standard deviation of the data. (5 points)

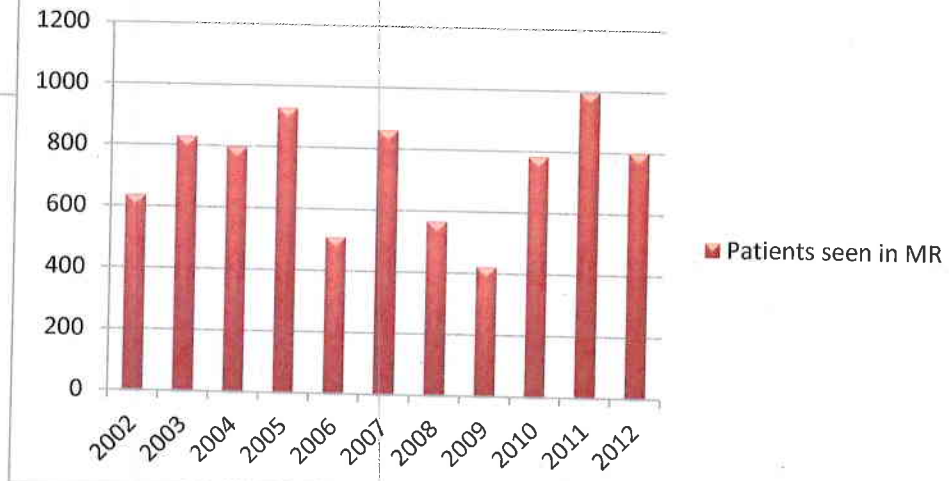
$$\approx 2.41 = s$$

4. Use the information from the graph below to answer the questions that follow.

Patients seen in Radiology



Patients seen in MRI



a. In what year was the largest number of patients seen in the Radiology Lab? (7 points)

2006

b. In what year was the smallest number of patients seen in the MRI? (7 points)

2009

c. In the year with the largest number of MRI patients, approximately how many patients were seen? (Approximate to the nearest 50.) (7 points)

≈ 1000

- d. In 2003, approximately 600 patients were seen in the radiology lab. Use a proportion and the information from the chart to determine approximately how many patients were seen in the following year, 2004. (8 points)

$$\frac{600}{10\%} = \frac{x}{4\%}$$

$$\frac{4 \times 600}{10} = x = 240$$

5. Perform the operations by hand. You must show work on these problems to receive credit. You may check your answers in a calculator, but give exact answers in all cases. (8 points each)

a.
$$\begin{array}{r} 245.129 \\ +73.896 \\ \hline \end{array}$$

$$319.025$$

b.
$$7\frac{4}{5} - 6\frac{8}{9} = \frac{9}{9} \frac{39}{5} - \frac{62}{9} \frac{5}{5} =$$

$$\frac{351}{45} - \frac{310}{45} =$$

$$\frac{41}{45}$$

c.
$$3^2 + 2(11 - 6) \div 10 - 2^4(8 + 1)^2 \div 18 \times 5 \times 10^{-1} + (\sqrt{81} + 4) \times 2 =$$
 0

$$9 + 2(5) \div 10 - 16(9)^2 \div 18 \times 5 \div 10 + (9 + 4) \times 2 =$$

$$9 + 10 \div 10 - 16 \times 81 \div 18 \times 5 \div 10 + 13 \times 2 =$$

$$9 + 1 - 1296 \div 18 \times 5 \div 10 + 26 =$$

$$10 - 72 \times 5 \div 10 + 26 = 10 - 360 \div 10 + 26 =$$

$$10 - 36 + 26 = 0$$

6. Find the value of the expression $(4.6 \times 10^4) \div (6.8 \times 10^6)$ and write the result in scientific notation. (9 points)

$$6.76 \times 10^{-3}$$

7. Find the Greatest Common Factor of 16 and 18. (8 points)

2

8. Find the Least Common Multiple of 16 and 18. (8 points)

144

9. For the Roman numerals below, write the Arabic representation of the numbers. For the Arabic numbers, write the Roman numeral equivalent. (8 points each)

a. LV

55

b. 2208

MMCCXIII

c. 804

DCCCIV

d. LXIX

69

10. A certain medication is to be given as 12 mg per 75 lbs of body weight. Your patient is 190 lbs. How much medication should be given, in mg? You may round your answer to one decimal place if needed. (10 points)

$$\frac{12 \text{ mg}}{75 \text{ lbs}} = \frac{x}{190 \text{ lbs}}$$

$$\frac{12 \times 190}{75} = 30.4 \text{ mg}$$

11. Write the abbreviations for the following terms. (4 points each).

a. Decimeter

dm

b. Dram

ʒ or dr

c. Microliter

mcL

d. Milligram

mg

12. Write out the word(s) for each of the following abbreviations or symbols. (4 points each)

a. mcg

microgram

b. km

kilometers

c. cg

centigram

d. oz.

ounce

13. Make the following conversions (within in the same system). (8 points each)

a. 70 mg is equivalent to 0.7 dg.

$$\frac{70 \text{ mg}}{1} \cdot \frac{1 \text{ dg}}{100 \text{ mg}} = .7$$

b. 450 mg/L is equivalent to .45 G/L.

$$\frac{450 \text{ mg}}{1 \text{ L}} \cdot \frac{1 \text{ G}}{1000 \text{ mg}} = .45$$

c. 1600 ft is equivalent to .30 mi. (you may round to 2 decimal places if needed here)

$$\frac{1600 \text{ ft}}{1} \cdot \frac{1 \text{ mi}}{5280 \text{ ft}} = .3030 \dots \text{ mi}$$

14. Write the following expressions in the appropriate apothecary notation. (4 points each)

a. 15 drams

3 xv

b. 4 pounds

iv

15. Using the conversions in the table below between apothecary/U.S. Customary units and the metric system, make the following conversions. (These approximations are approximate. Round to one decimal place if needed.) (8 points each)

Metric	Apothecary	U.S Customary
5 ml		1 tsp
30 ml	1 ounce	1 ounce
1 liter		1 qt
2.5 cm		1 in

1 m		39 in
1 km		0.6 mi
60 mg	1 grain	
1 g	15 grains	
1 kg		2.2 lbs

a. 2 kg is equivalent to 4.4 lbs.

$$\frac{2 \text{ kg}}{1} \cdot \frac{2.2 \text{ lbs}}{1 \text{ kg}} =$$

b. 16 in is equivalent to 40 cm.

$$\frac{16 \text{ in}}{1} \cdot \frac{2.5 \text{ cm}}{1 \text{ in}} =$$

c. gr xv is equivalent to 900 mg.

$$\frac{15 \text{ gr}}{1} \cdot \frac{60 \text{ mg}}{1 \text{ gr}} =$$

16. Write out in English what the doctor is ordering for the patient on the form below. Be sure to explain all abbreviations in your description. (16 points)

Lawrence Merry, M.D.
4th Street and Jones Ave.
Holly, GA 00111
phone# - 001-855-2176

Patient Name _____ Date _____
Address _____ Age _____

Rx hydrocodone w/APAP 5/500
 #20
 sig: i or ii tab q6-8h prn pain

DEAN XX112233 Refill _____

prescription: hydrocodone w/ APAP 5/500
20 tablets

directions: 1 or 2 tablets every 6-8 hours
as needed for pain