Name Key

Math Lit Cycle 1 Exam

1. List strategies students should use to have success in a math class.

Answers will vary.

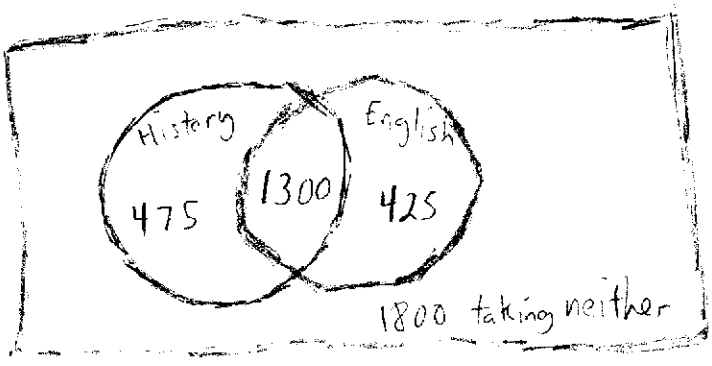
2. In a freshmen class of 4000 students at a particular college, 2200 are taking either a history or English class their first semester. Of these 2200 students, 1300 are taking both a history class and an English class, and 475 are taking only a history class.

   a. Draw a Venn diagram to represent this information. Write numbers in each section to indicate how many students are in that particular category.

4000 total
- 2200
1800

1300
+475
1775

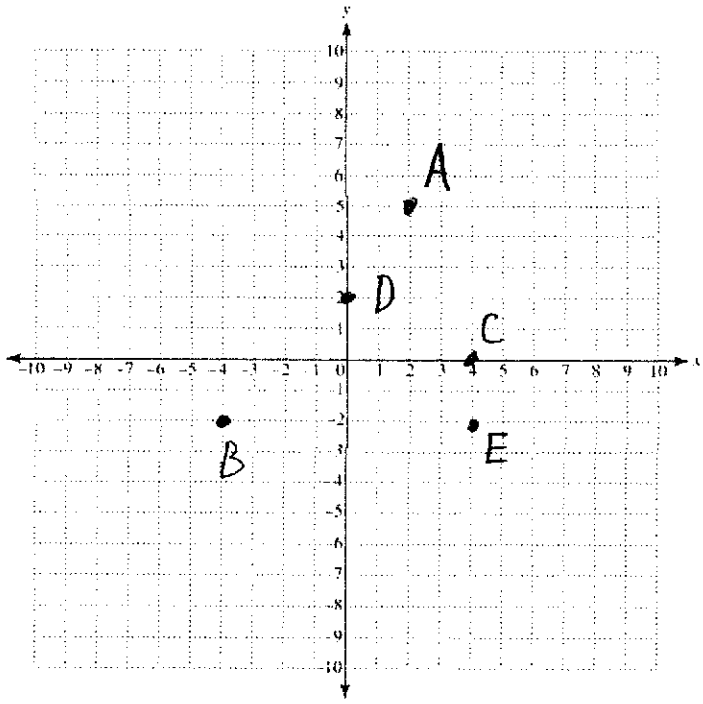
2200
- 1775
425



   b. How many students are taking an English class but not a history class? 425

   c. How many students are taking neither of these classes? 1800

3. Plot each of the following ordered pairs as points on the grid. Label each point with its letter. List the quadrant (by Roman numeral) or axis to describe the location of each point.



		Axis or quadrant
A	(2, 5)	
B	(-4, -2)	
C	(4, 0)	
D	(0, 2)	
E	(4, -2)	

4. Circle the letter of the true statement(s) about a sales tax rate of 7.5%. There may be more than one correct answer.

(a.) You will pay 7.5 cents in sales tax for every dollar purchase.

(b.) You will Pay $7.50 in sales tax for every $100 purchase.

c. A $1000 purchase would have $75.00 in sales taxes.

d. You will pay $18,150 in sales taxes on a $22,000 car.

e. You can calculate your sales tax by multiplying the purchase price of an item by 7.5.

5. One year, Jill made $95,000 writing software. What was hourly wage? Assume a working week of 50 hours per week for 48 weeks. Round to the nearest cent. $39.58/hr

$$\frac{\$95,000}{1 \text{ work year}} \times \frac{1 \text{ work year}}{48 \text{ work weeks}} \times \frac{1 \text{ work week}}{50 \text{ hr}} = \frac{\$39.58}{\text{hr}}$$

6. A cookie recipe calls for ¾ of a cup of flour and makes one dozen cookies. How many cookies can you make if you have 10 cups of flour and want to use it all? Show your work or explain your reasoning.

$\frac{3}{4}$ cup makes 12 cookies

10 cups makes ? cookies

$\frac{10 \text{ cups}}{\frac{3}{4} \text{ cups}} = \frac{10}{1} \cdot \frac{4}{3} = \frac{40}{3}$

$\frac{40}{3} \times 12 \text{ cookies} = \boxed{160 \text{ cookies}}$

7. Perform each of the fraction operations and write your answers in simplest form. Show all the work. Use your calculator only to check.

a. $\frac{5}{7} + \frac{3}{8} = \frac{40}{56} + \frac{21}{56} = \frac{61}{56} = \boxed{1\frac{5}{56}}$

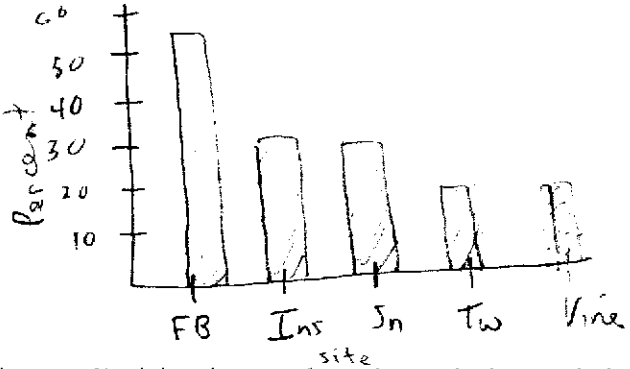
b. $\frac{3}{5} - \frac{2}{7} = \frac{21}{35} - \frac{10}{35} = \boxed{\frac{11}{35}}$

c. $\frac{1}{\cancel{9}_{3}} \cdot \frac{\cancel{3}^{1}}{7} = \boxed{\frac{1}{21}}$

d. $\frac{7}{8} \div \frac{2}{7} = \frac{7}{8} \cdot \frac{7}{2} = \frac{49}{16} = \boxed{4\frac{1}{16}}$

8. a. *The following data shows the percent of* students in a college class who use various forms of social media. Represent this data as a bar or pie graph.

Social Media	Percent
Facebook	55
Instagram	30
Snapchat	28
Twitter	14
Vine	13



b. Explain why you chose the particular graph that you did.

Since some students use more than 1 social media site, a pie chart is inappropriate.

9. Consider the following data.

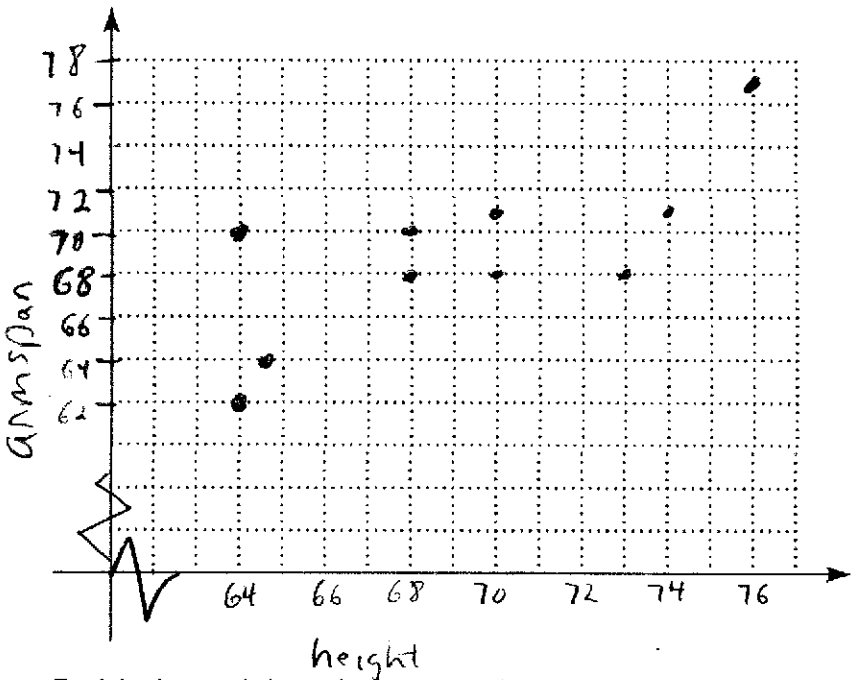
Height (inches)	Armspan (inches)
64	62
68	70
70	71
73	68
76	77
65	64
64	70
68	68
74	71
70	68

a. If a researcher wants to build a model to predict armspan based on height, which variable should be treated as the independent variable? Which variable should be treated as the dependent variable?

Independent variable: height

Dependent variable: armspan

b. Create a scatterplot for the data. Label your axes and clearly indicate the scale on each axis.



c. Explain the trend shown in the scatterplot.

It appears that taller people have longer armspans

10. One food calorie provides 4,184 Joules of energy.

a. If you consume 2,480 calories per day, how many Joules of energy does your diet provide?

$$\frac{2480 \text{ cal}}{1} \cdot \frac{4184 \text{ joules}}{1 \text{ cal}} = 10{,}376{,}320 \text{ joules}$$

b. How many seconds are in one day?

$$\frac{1 \text{ day}}{1} \times \frac{24 \text{ hr}}{1 \text{ day}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{60 \text{ sec}}{1 \text{ min}} = 86{,}400 \text{ sec}$$

c. Use your answers from parts a and b to determine how many Watts of power you have each day if a Watt is defined as one Joule per second. Round your answer to the nearest whole number.

$$1 \text{ watt} = \frac{1 \text{ joul}}{\text{sec}} \qquad \frac{10{,}376{,}320 \text{ joul}}{86{,}400 \text{ sec}} = 120 \text{ watts}$$

11. Gas prices have recently increased from a nationwide average of \$3.20/gallon to \$3.35/gallon nationally. Round each answer to one decimal place.

a. By what percent have gas prices increased?

\$0.15 is what percent of \$3.20?

$$\$0.15 = p \times \$3.20 \qquad p = \frac{0.15}{3.20} = 0.046875 = 4.7\%$$

b. If the average gas price decreases from \$3.35/gallon back down to \$3.20/gallon, will the percent decrease be the same as your answer to part a? Explain.

\$0.15 is what percent of \$3.35?

$$0.15 = p \times \$3.35 \quad \text{and} \quad p = \frac{0.15}{3.35} = 0.044776119 = 4.5\%$$

12. Suppose the tuition at a community college is currently \$80/credit hour. If the tuition is increased by 20%, what is the new tuition rate?

20% of \$80 = \$16

$0.2 \times 80 = \$16$ then $\$80 + \$16 = \$96$/unit

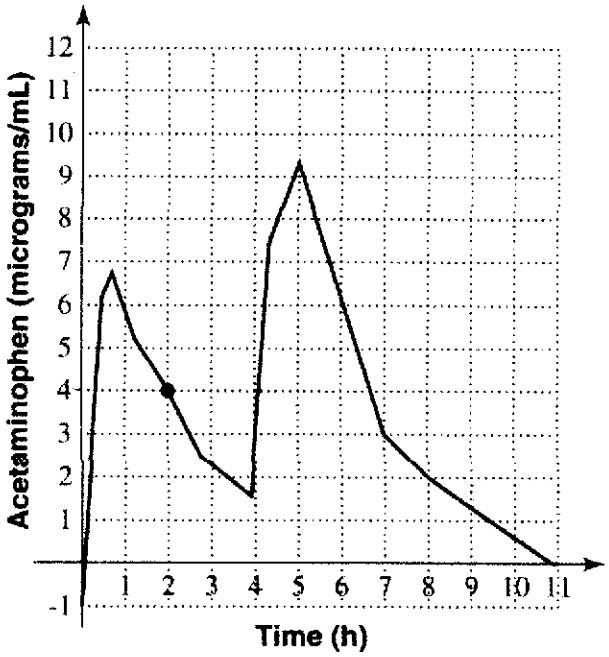
13. a. Write an expression for the salary of a salesman who earns \$40,000 plus 12% of his sales in commissions. Let S stand for the amount of his sales.

40,000 + 0.12S

b. The salesman sets a goal of earning \$60,000 this year. He wants to determine how much money in commissions he needs to earn to reach his goal. Write an equation that would allow him to solve this problem.

40,000 + 0.12S = 60,000

14. Use the graph to answer the questions that follow.



a. When does the medication shown in the graph reach its highest concentration?

5 hours after it is taken.

b. When is the level of the medication in the bloodstream greater than 4 micrograms per milliliter? from approx. 20 min. to 2 hours and from approx 4 hours, 10 min. to 6 hours, 45 min.

c. Write a sentence to interpret the point (2,4) on the graph.

After 2 hours the concentration of acetaminophen is 4 micrograms/mL.

15. Use the nutrition label to answer the questions that follow.

	Calories	Calories from Fat	Total Fat (g)	Saturated Fat (g)	Sodium (mg)	Protein (g)
Black Forest Ham Sandwich	290	40	4.5	1	830	18
Oven Roasted Chicken Sandwich	320	45	5	1.5	640	23
Roast Beef Sandwich	320	40	5	1.5	700	24

a. For the Roast Beef sandwich, what percent of the total calories are from fat?

$\frac{40}{320} \times 100 = 12.5\%$

b. For the Oven Roasted Chicken sandwich and the Roast Beef sandwich, are the calories and protein in proportion? Show work to support your answer.

No, $\frac{320 \text{ calories}}{23 \text{ grams}} \neq \frac{320 \text{ calories}}{24 \text{ grams}}$

16. A doctor orders 200 mg of an antibiotic for an infant who weighs 15.4 lb. It should be taken every 8 hours. The medication label shows that 75-150 mg/kg per day is the appropriate dosage range.

200 mg for every 8 hours for every 15.4 lb
600 mg for every day for every 7 kg.

$\frac{15.4 \text{ lb}}{1} \times \frac{1 \text{ kg}}{2.2 \text{ lb}} = 7 \text{ kg}$ infant weight

acceptable range $7 \text{ kg} \times \frac{75 \text{ mg}}{\text{kg}}$ per day to $7 \text{ kg} \times \frac{150 \text{ mg}}{\text{kg}}$ per day

or 525 mg/day to 1050 mg/day.

The appropriate dosage range for an infant weighing 15.4 lb is 525 – 1050 mg/day. The doctor prescribed 600 mg/day, which is in this range.