Math 75 – Final Exam Name ….…….....……

This exam is worth 200 points. Show all work to receive full credit. Good Luck!

1. (10 pts) Calculate the GPA for the following student record. Round the GPA to two decimal places. (A = 4, B=3, etc…)

Class (credit hours)	Letter Grade
Math (5)	C
Speech (3)	B
History (3)	C
Comp and Lit (3)	B
Music (2)	A

2. (15 pts) Identify each equation as either *linear*, *quadratic*, *exponential*, *rational*, *radical*, or *none of these*.

(a) $3x - 2 - 5(x - 1) = \frac{6-4x}{2x}$ _____

(b) $\sqrt{2x - 5} = 36$ _____

(c) $\frac{1}{20}x = 4x - 2$ _____

(d) $5x^3 = 28$ _____

(e) $5(2)^x + 1 = 4$ _____

3. (20 pts) Short answer.

(a) If the tuition at a community college is increased by 30%, what is the value of the growth factor?

_____

(b) If your healthcare contributions increase from $120 to $360 each paycheck, what is the percent increase?

_____

(c) Write a formula for a quadratic function that would open downward.

y = _____

(d) Write 475,000,000,000 in scientific notation _____

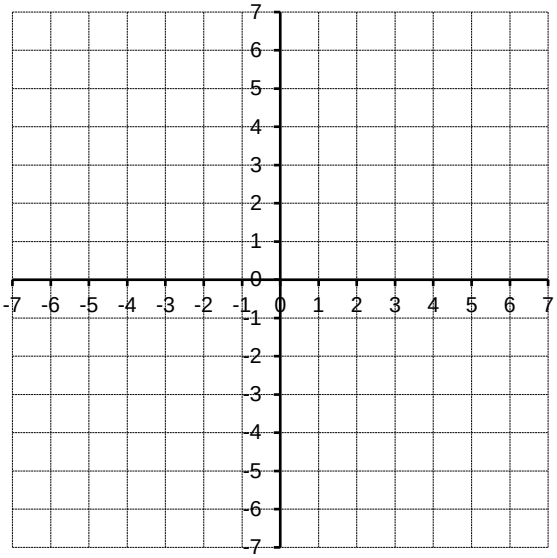
(e) If your grade and the number of hours you study have a positive correlation, then as the number of hours of study increase, your grade would _____.

4. (12 pts)

(a) Graph the line $y = -\frac{2}{3}x + 5$.

(b) Draw a line parallel to the line graphed that passes through the point (-2, -1).

(c) Write the equation of the line you drew in (b).



5. [20 pts] A student currently has a debt from an interest-free loan totaling $50,000. He decides to start paying off his debt by $2000 every month.

   a) If the debt continues to decrease at this rate, write a liner model for the amount of money owed on the loan after *x* months.

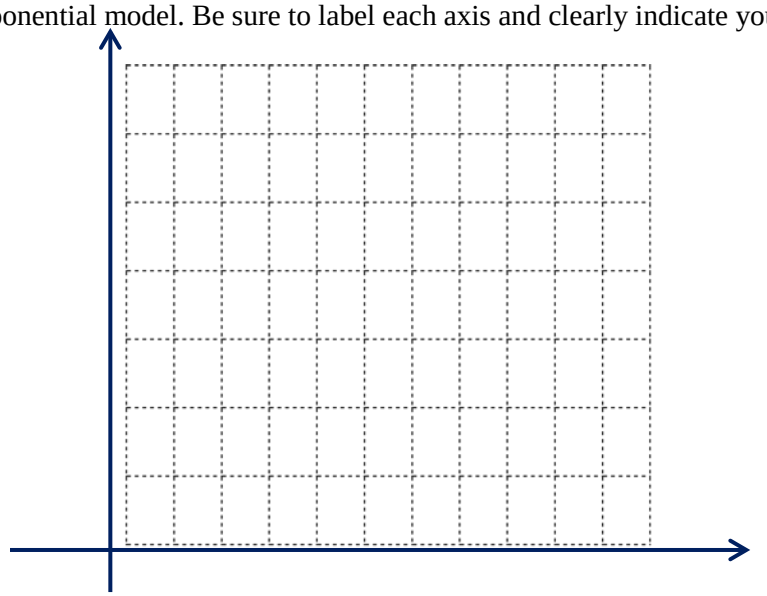
   Fill in the table to help you get started:

No. of months *x*	Amount of Debt *D*
0	
1	
2	
3	
4	

   The linear model is:

   $D =$ _____

   b) Graph the exponential model. Be sure to label each axis and clearly indicate your scale.



   c) If this trend continues, how many months will it be before his debt is $38000? Find the exact answer and also show your solution on the graph above.

6. [20 pts] A student currently has a debt from an interest-free loan totaling $50,000. She decides to start paying off her debt by 10% every month.

   a) If the debt continues to decrease by 10% each month, write an exponential model for the amount owed on the loan after *x* months.

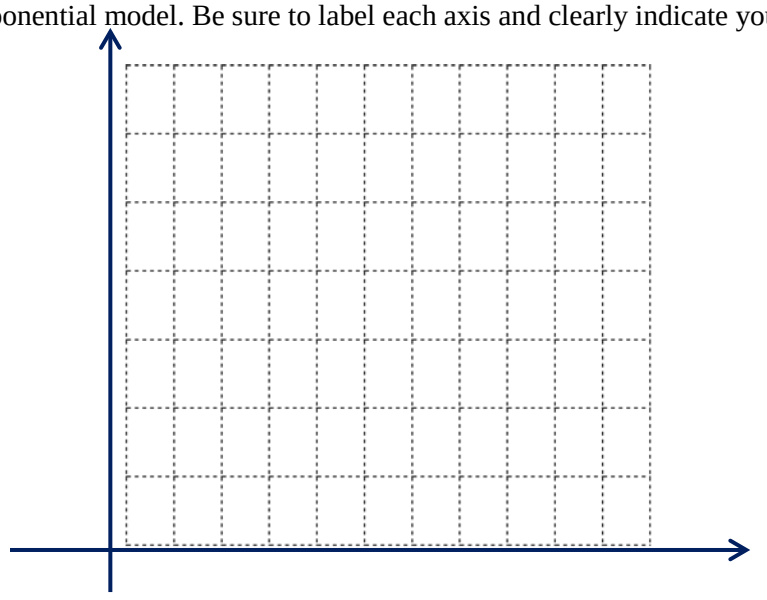
   Fill in the table to help you get started.

No. of months *x*	Amount of Debt *D*
0	
1	
2	
3	
4	

   The exponential model is:

   $D =$ _____

   b) Graph the exponential model. Be sure to label each axis and clearly indicate your scale.



   c) If this trend continues, *approximately* how many months will it be before debt is $38000? Show your solution on the graph above.

7. (16 pts) Match each equation with one of the graphs below. (No Calculator!) In each case give one reason for your choice.

(a) $y = -20 - 5x$ .....

Reason: .....

(b) $y = -20x$ .....

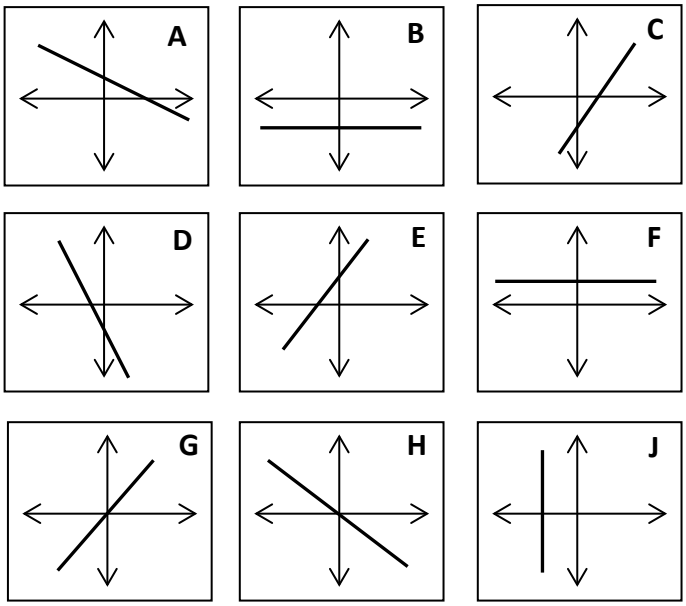
Reason: .....

(c) $x = -20$ .....

Reason: .....

(d) $y = 5x - 20$ .....

Reason: .....



8. [16 pts] Simplify. Write answers with positive exponents.

a. $(-2x)^3$

b. $\dfrac{10x^5}{25x^7}$

c. $\dfrac{6x^{-5}y^0}{-3x^2y^4}$

d. $-15+8(7-4x)$

9. (10 pts) Convert 5,280 inches to miles. Use the conversion chart below and show your units in each step.

Commonly used unit conversions:

1 ft = 12 in.	1 in. = 2.54 cm	1 L = 1,000 mL	1 min = 60 sec
1 mi = 5,280 ft	1 km = 1,000 m	1 lb = 16 oz	1 hr = 60 min
1 yd = 3 ft	1 m = 100 cm	1 kg = 1,000 g	1 yr = 52 weeks
1 km ≈ 0.62 mi	1 cm = 10 mm	1 g = 1,000 mg	1 week = 7 days
1 mi ≈ 1.61 km		1 ton = 2,000 lb	
		1 gal = 4 qt	
		1 kg ≈ 2.2 lb	

10. (15 pts) Solve the system using substitution:

$$2x + y = -6$$
$$5x + y = 0$$

11. (16 pts) Suppose a bank's manager is evaluating the number of lanes open and wait times. When there are fewer lanes open, the average wait time is 6.8 minutes and the standard deviation is 1.2 minutes.

    When there are many lanes open the wait times in minutes for a weekday are as follows:

    1.2 10.1 2.3 4.6 6.8

    a) Find the average wait time when many lanes are open.

    b) Find the standard deviation of wait times when many lanes are open. Round to one decimal place.

    c) Which of the above scenarios has longer wait times? Fewer or more lanes open? Use the appropriate statistics to support your reasoning.

    d) Which of the above scenarios has more consistent wait times? Fewer or more lanes open? Use the appropriate statistics to support your reasoning.

12. (30 pts)Solve the following equations:

a) $-\frac{3}{4}x = 12$

b) $-5(x+1) = 15$

c) $6x + 4 - 2x = 4x + 8$

d) $\sqrt{x+5} = 7$

e) $\frac{5x-1}{2} = \frac{3x}{4}$

f) $3x - 2 - 5(x-1) = \frac{6-4x}{2}$