

NAME:

Math 70
Final Exam

Question	Score
1	
2	
3	
4	
5	
6	
7	
8	
Total	

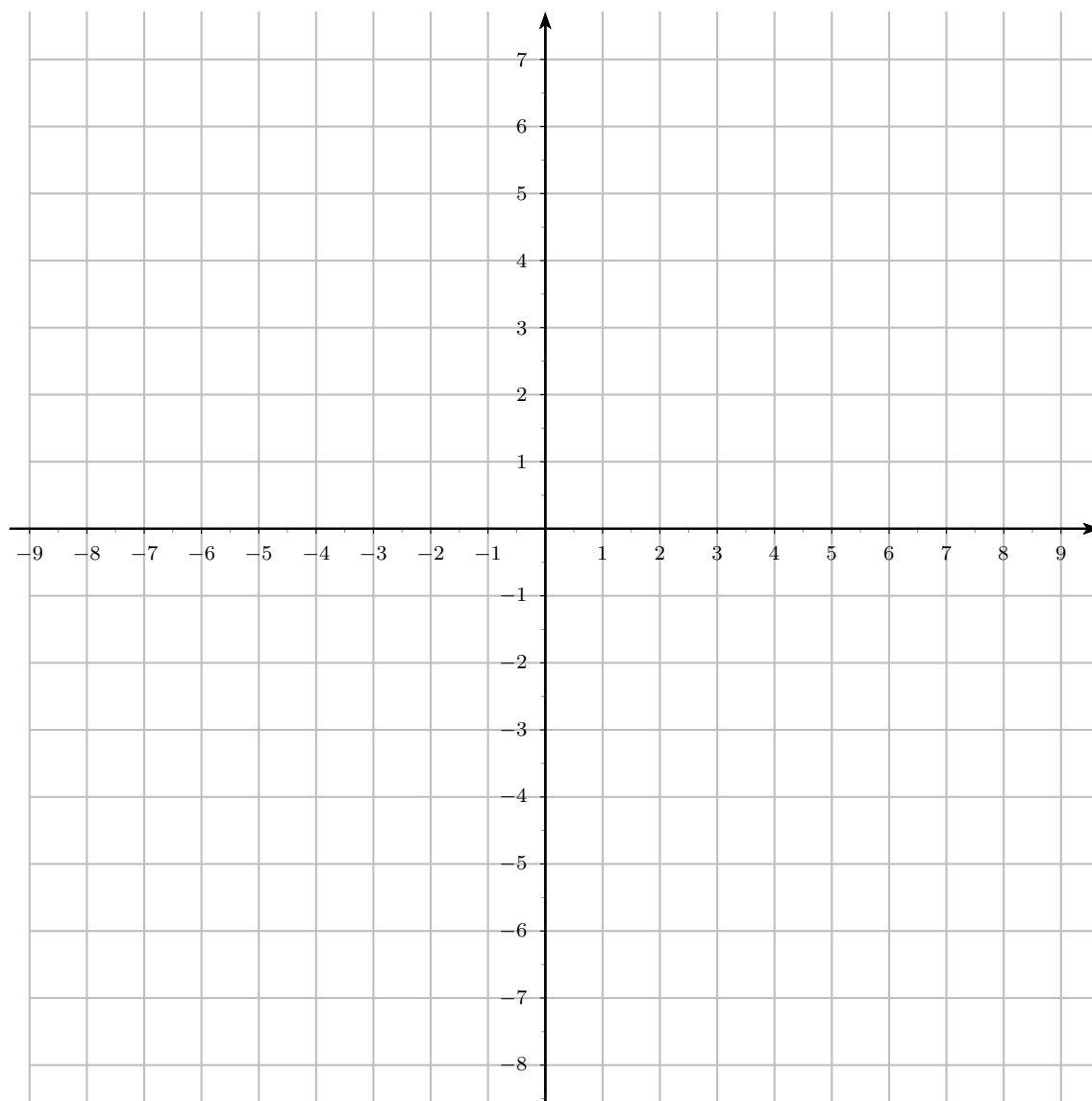
1. Ted the Tutor charges \$20 per session for a group lesson and \$30 per session for a private lesson. One week he tutors a total of 15 sessions and makes \$390.00. How many of each type of session did he teach?

2. Graph the solution of this system of inequalities and describe the solution by identifying it and naming its vertices.

$$2x + 3y \leq 15$$

$$3y - x < -3$$

$$y \geq -1$$



3. The dosage of a certain drug diminishes in the patients system exponentially. Based on the results in the table, write an equation and sketch a graph of the function that illustrates the diminishing amount of the drug that remains over time.

Time in Hours (s)	Amount (mg)
1	240
3	60

4. Show an equation, a table (with at least 5 x -values), and a graph for the function $\log_2(x)$ shifted 2 units to the left and 4 units upward.

5. The graph of a quadratic function is a parabola with x-intercepts $(1, 0)$ and $(5, 0)$ and vertex $(3, 8)$. Write an equation for it.

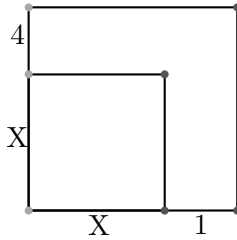
6. Following completion of chemotherapy, a cancer patients white blood cell count is 63 per milliliter and grows exponentially at a rate of 14% per day. How long will it take for the patients white blood cell count to double? (Give an algebraic answer in terms of logarithms as well as an exact answer using a calculator.)

7. The pH of a solution is a measure of how acidic or alkaline the solution is. A solution with pH less than 7 is acidic, and a solution with pH greater than 7 is alkaline. The pH of a solution is given by:

$$\text{pH} = -\log(\text{hydrogen ion concentration}).$$

The hydrogen ion concentration of sea water is 10^{-9} and the hydrogen ion concentration of good potato-growing soil is about 10^{-8} . Are sea water and potato-growing soil acidic or alkaline? Which is more alkaline and by how much?

8. Delbert has a square deck that he wants to expand so there will be more room to party. His plans to add 4 meters in one direction and 1 meters in another to create a rectangular deck, as shown below. The new deck will have an area of 40 square meters.



Delbert arrives at Home Depot to buy supplies, when he remembers that he does not know the dimensions of the original deck. Show him how to use algebra to figure this out. Give your answer to the nearest tenth.