

117 Review Guide for Final Exam

The Final Exam is 7 pages long and contains 50 questions, some with multiple parts. The first part is function identification. You will be given the following chart.

For each of the functions, graphs, or tables in problems 1-8:

- a. Determine the type of function and write it in the blank next to the problem;
- b. Answer the questions corresponding to the blanks numbered 1, 2, & 3 using the following:

| Type of function | Questions to answer in blanks 1, 2, & 3 |
|----------------------|--|
| A. Linear | a. slope b. coordinates of y-intercept c. coordinates of real root |
| B. Quadratic | a. coordinates of vertex b. is vertex a maximum or minimum? c. coordinates of y-intercept |
| C. Exponential | a. does it show growth or decay? b. coordinates of y-intercept c. # x-intercepts |
| D. Inverse Variation | a. what quadrant(s) will you find the graph in? b. Is there a name for this type of graph? c. # x-intercepts |

Then you will be given 8 functions to identify. The form of the function could be a table, a graph, or an equation. Two complete examples are given below.

1. $f(t) = -5t + 8t$ _____
type of function

(1) _____

(2) _____

(3) _____

2. $f(d) = -100/d$ _____
type of function

(1) _____

(2) _____

(3) _____

Other problems to try:

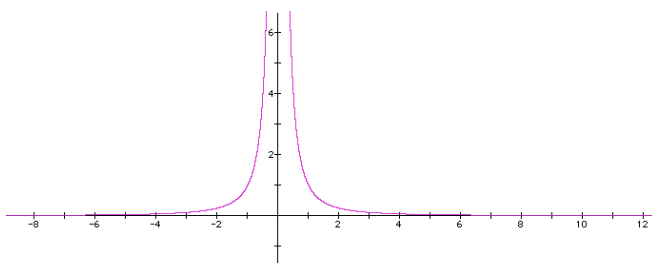
3. $g(x) = (x+3)(x-2)$

| | | | | | |
|--------|---|---|----|-----|-----|
| 4. x | 0 | 1 | 2 | 3 | 4 |
| | | | | | |
| y | 2 | 8 | 32 | 128 | 512 |

| | | | | | |
|--------|-----|----|----|----|-----|
| 5. x | 0 | 1 | 2 | 3 | 4 |
| | | | | | |
| y | -18 | -6 | -2 | -6 | -18 |

6. $f(x) = 90(.6)^x$

7.



You will be given sequences and asked to write the missing terms of the sequence, and to identify the sequence as arithmetic, geometric, Fibonacci, triangular, square, or other.

Example:

8. 1, 2, 3, 5, 8, _____, _____, ... _____

9. 4, _____, _____, _____, 16, 19 ... _____

You need to know how to use the recursive feature of your calculator.

10. You will be given tables of "messy data" and asked to find the line of best fit using your calculator. An example is given:

| x | y |
|---|-----|
| 2 | 5 |
| 3 | 7 |
| 4 | 8.6 |
| 5 | 11 |

You will be asked to use your line to predict y for a given value of x.

You will also be asked to find a quadratic or exponential which fits a set of data.

You will need to be able to give R^2 for any regression model.

11. You will be given an equation to solve, using your calculator. An example is given.

Solve: $-5.6 = 0.23x - 14.5$ for x to the nearest hundredth.

There will be 6 word problems with multiple parts. Examples:

12. The number of bushels of barley an acre of land will yield depends on how many seeds per acre you plant. From previous planting statistics you find that if you plant 2 million seeds per acre, you can harvest 22 bushels per acre, and if you plant 4 million seeds per acre you can harvest 40 bushels per acre. As you plant more seeds per acre, the harvest will reach a maximum, then decrease. This happens because the young plants crowd each other out and compete for food and sunlight. Assume that the number of bushels per acre varies quadratically with the number of millions of seeds per acre planted. Find the equation for this problem. How many bushels per acre would you expect to get if you plant 16 million seeds per acre? According to the model, is it possible to plant so many seeds that you have no barley at all?

13. The Census Bureau reports that 82% of American over the age of 25 are high school graduates. A survey of randomly selected Douglas County residents included 1250 who were over the age of 25. What is the probability that at least 1000 were high school graduates?

There will be questions on the Metric System. You should know base units and prefixes.

You need to know how to do internal conversions. For example:

14. 3500 mg = _____ g

15. 0.025 km = _____ dm

You will be asked to write either an inverse, a converse, or a contrapositive of a given statement. You will be asked to complete a truth table. Example:

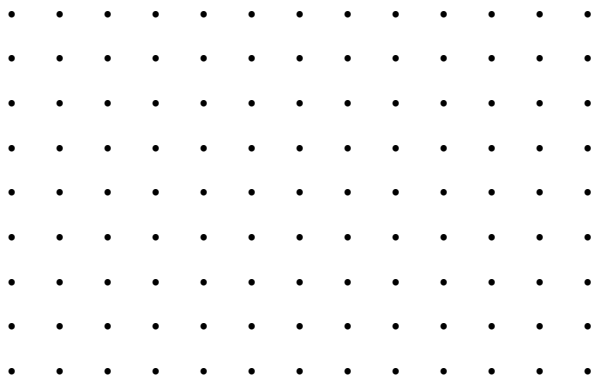
16.

| p | q | $\sim p$ | $\sim q$ | $\sim p \vee \sim q$ | $\sim(\sim p \vee \sim q)$ |
|---|---|----------|----------|----------------------|----------------------------|
| | | | | | |

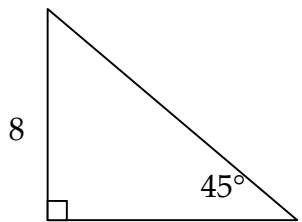
17. Know the names and characteristics of the Platonic solids.

18. You will have 1-2 problems on Taxicab Geometry. Example: Find the taxicab perimeter of the triangle formed by the points (2,1), (8,7) and (10,3).

You may use the dots below to help you draw a picture.



19. You will be asked to find areas of given geometric figures. Example: Find the area of the figure. What happens to the area if each side is Tripled?



20. You will be asked a construction question (using compass and straightedge). You will either have to do the construction, or have to explain how it is done. Example: How would you construct a circumcenter?

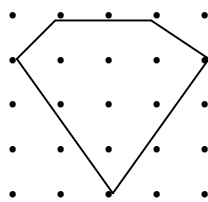
21. Know the golden ratio and pi and how to find them and use them in problems.

21. Be prepared to show how to find probabilities using "both-and" and "either-or" rules.
Example: If a box contains 4 green, 3 red, and 5 white marbles, and you reach in the box and draw two marbles without looking, what is the probability that you have 2 marbles of the same color? Draw a tree diagram with probabilities on the branches. Use rules of probability to demonstrate the probability.

23. You will be asked geometry questions such as finding angle measures of a figure, finding angles from parallel lines cut by a transversal, exterior angles of a regular polygon, etc. example: If an exterior angle of a regular polygon is 20° , how many sides does it have?

24. Geoboard questions (from Geoboard using geo-grids lab). Example:

Find the area of the following figure:



25. Know the Pythagorean Theorem and be prepared to use it. Example:

Could the following numbers represent lengths of a right triangle? 10, 20, 36

Review Bar Codes.

26. What does UPC stand for?

27. If a check digit is "MOD 10," what would be the check digit for 234169587 ___ ?

To be fully prepared for the Final Exam, you should review the two Unit tests and the practice tests given to you, review all homework and all lab activities. You *will* be asked questions about lab activities. I will email you about office hours (121 Altgeld) during Finals week. There will be a review session for the Final; you will receive email telling you when and where the session will be held.