Math 4 Final Exam Study Guide – This is not all-inclusive. You need to review your notes, old quizzes, and practice worksheets. The final is 15% of your final grade.

Unit 1 – Statistics and the central limit theorem

_____ 2) For the numbers below, find the probability that lies between them. z = -0.47 and z = -1.37

_____ 3) What is the probability that x is less than 50? (Assume μ = 45 and σ = 5)

_____ 4) The Welcher Adult Intelligence Test Scale is composed of a number of subtests. On one subtest, the raw scores have a mean of 35 and a standard deviation of 6. Assuming these raw scores form a normal distribution. What is the probability of getting a raw score between 29 and 41?

_____ 5) Scores on the SAT form a normal distribution with μ = 500 and σ = 100. What is the probability of your score being less than 585? P (X < 585)

_____ 6) Scores on the SAT form a normal distribution with μ = 500 and σ = 100. If 10 students take the SAT, what is the probability that their average will be less than 585? P (X_{bar} < 585)

According to a government study among adults 25 to 34 year age group, the mean amount spent per year on reading and entertainment is $1,994. Assume that the distribution is normally distributed with a standard deviation of $450.

_____ 7) What is the probability that a random adult in that age range will spend more than $2,794 per year on reading and entertainment.

_____ 8) What is the probability that a group 25 adults in that age range will spend more than $2,100 per year on reading and entertainment.

9) Which is more likely, that a random adult spend more than $2,794 per year or that the average that 25 adults spend in a year is more than $2,100? Why do you suppose that is the case?

_____ 10) Assume that a school district has 10,000 6th graders. In this district, the average weight of a 6th grader is 80 pounds, with a standard deviation of 20 pounds. Suppose you draw a random sample of 50 students, what is the probability that the average weight of the sampled students will be less than 75 pounds?

Unit 2 – Sequences and Series

Find the first 5 terms of the following sequences

1) $a_n = n(n-4)(n-3)$

a_1	
a_2	
a_3	
a_4	
a_5	

2) $a_n = a_{n-1} + (18-n)$

a_1	
a_2	
a_3	
a_4	
a_5	

Find the next four terms of each sequence

1) 32, 16, 8, 4, _____, _____,_____,_____

2) 3, -6, 12, -24, _____,_____,_____,_____

Find the 7th term using the given sequence formula

3) $a_n = n^2 - 5$ 7th term = _____

4) $a_n = a_{n-1} + 2n$ Where $a_1 = 2$ 7th term = _____

Use the following sequence for the next 3 questions: $\{4, 19, 34, ...\}$

5) Find the common difference: d=_____
6) Find the explicit formula: _____
7) Find the recursive formula: _____

Given the following information, solve for the unknown:

8) If $a_{14} = 80$ and $d = 9$, then $a_1 =$_____
9) If $a_n = 14$, $a_1 = -46$ and $d = 5$, then $n =$_____
10) **Find the 32nd finite sum** of this finite sequence $\{3, 18, 33, ..., 468\}$

Find the next four terms of each sequence

1) 12, 14, 16, 18, _____, _____,_____,_____

2) 2, -6, 18, -54, _____,_____,_____,_____

Find the 5th term using the given sequence formula

3) $a_n = 2n^2 + 3$ 5th term = _____

4) $a_n = 2a_{n-1}$ Where $a_1 = 1$ 5th term = _____

Use the following sequence for the next 3 questions: $\{-5, -10, -20, ...\}$

5) Find the common ratio: r=_____
   Find the explicit geometric formula: _____
6) Find the recursive geometric formula: _____

Given the following information, solve for the unknown: (Use the explicit form of the geometric sequences)

7) If $a_4 = 80$ and $r = 2$, then $a_1 =$ _____

8) If $a_3 = 200$, and $r = 5$, then $a_1 =$ _____

9) **Find the 10th finite sum** of this finite geometric sequence $\{2, 4, 8, ...\}$

Unit 3 – Rational Functions

Inequalities – Draw the number line and write the interval notation

1. $\dfrac{3}{x(x+2)} > 0$

2. $\dfrac{3x}{(x-3)(x+2)} \leq 0$

3. $\dfrac{(x-1)}{(x-3)} \geq 0$

4. $\dfrac{x}{(3-x)} < 0$

5. $\dfrac{x}{(-x-2)} \geq 0$

Decomposition of rational expressions

6. $\dfrac{25}{(x-3)(x+2)}$

7. $\dfrac{25}{(x-3)(x+2)^2}$

8. $\dfrac{15x}{(x-4)(x+1)}$

9. $\dfrac{75x}{(x-4)(x+1)^2}$

10. $\dfrac{12x}{(x-3)(x+1)}$

11. $\dfrac{48x}{(x-3)(x+1)^2}$

Find the following for:

Function: x-int, y-int, VA, HA, Domain, Range

Inverse: the inverse function, x-int, y-int, VA, HA, Domain, Range

12. $y = \dfrac{3}{x+1}$

13. $y = \dfrac{3x+1}{x+1}$

14. $y = \dfrac{4}{x-2}$

15. $y = \dfrac{3x}{x+2}$

Unit 4 – Trigonometry – Use the worksheet given to you to study for your unit 4 test.