MATH 140 Final (1.1 - 7.6) Review

1. Know the properties of the real numbers and how to perform algebraic operations involving them.

2. Know how to graph intervals on the real line.

3. Know the definition of set and the *union* and *intersection* of sets.

4. Know how to evaluate the absolute value of a number and distance between two points on the real line.

5. Know the laws of exponents and how to simplify expressions involving exponents.

6. Know how to express numbers using scientific notation and how to multiply/divide numbers expressed in scientific notation.

7. Know how to evaluate and simplify expressions involving rational exponents and radicals.

8. Know how to find the sum, difference, product and quotient of algebraic expressions.

9. Know how to factor algebraic expressions including trinomials.

10. Know how to find the sum, difference, product and quotient of rational expressions.

11. Know how to solve basic equations and to form and solve basic models.

12. Know how to solve quadratic equations by: (a) factoring, (b) completing the square, and by the (c) quadratic formula.

13. Know the the definition of a complex number.

14. Know how to add, substract, multiply and divide complex numbers.

15. Know how to solve equations involving radicals and other fractional exponents.

16. Know how to solve and graph the solution to a linear inequality in one variable.

17. Know how to find the midpoint and distance between points in a rectangular coordinate system.

18. Know how to graph an equation in the coordinate plane, including the equation of a circle and of a parabola (quadratic equation).

19. Know how to graph the equation of a line, and the forms a line: general form, point-slope form, slope-intercept form.

20. Know how to find parallel and perpendicular lines to a given line.

21. Know the definition of a function and how to find the domain and range of a function.

22. Know the linear transformation and how they effect the graph of a function.

23. Know how to add, substract, multiply and divide functions and determine the resulting domains.

24. Know how to find the sum, difference, product, quotient and composite of a function and their respective domains.

25. Know how the intermediate value theorem and how to use it to show f has a zero in some interval.

26. Know how to sketch the graph of a polynomial and rational function.

27. Know how to divide polynomials using long division and synthetic division.

28. Know the remainder and factor theorem.

29. Know how to find the zeros of a polynomial.

30. Know Descartes rule of signs.

31. Know the first theorem on bounds for real zeros of a polynomials and how to find bounds for the real zeros of polynomials.

32. Know how to find the rational zeros of a polynomial and show that a polynomial has no rational zeros.

33. Know how to find the complex zeros of a polynomial.

34. Know how to find the domain, vertical & horizontal asymptotes of a rational function and be able to sketch its graph.

35. Know how to find equations for direct, inverse and joint variation.

36. Know how to determine if a function is one-to-one and how to find the inverse of a function.

37. Know how to find the domain and range of f and its inverse f^{-1} .

38. Know how to graph exponential functions and how to solve problems involving exponential functions.

39. Know how to graph logarithmic functions and how to solve problems involving logarithmic functions.

40. Know how the laws of logarithms and change of base formula for logarithms.

41. Know how to solve problems involving compound interest.

42. Know the definition of angle, acute, obtuse, complementary, supplementary, coterminal and quadrantal angle

43. Know how to write the angle in DMS (Degrees Minutes Seconds) form.

44. Know how to convert angle from degree to radian and from radians to degree.

45. Know the right triangle and circular definitions of the trigonometric functions of an angle.

46. Know the Pythagorean identities, reciprocal identities and tangent and cotangent identities.

47. Know the definition of periodic function and the trigonometric formulas for negatives of an angle.

48. Know how to graph the basic trigonometric functions.

49. Know how to determine the amplitude, period and phase shift (horizontal shift) for a trigonometric function.

50. Know how to verify trigonometric identities.

51. Know the sum & difference formulas for the basic trigonometric functions.

52. Know the multiple-angle formulas for the basic trigonometric functions.

53. Know the product-to-sum and the sum-to-product formulas.

54. Know how to solve problems involving the inverse trigonometric functions and solve trigonometric equations.

Example exercises: Quiz & Homework questions;

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Ch. 2 Review, #1-83

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