

Trig/PreCalculus CP



1) Complete attached problems

- a) # 1 - 50

2) Format

- a) Show all work and solutions on a separate sheet of paper.
- b) Clearly label each question and its solution.

3) Due Date

- a) September 6, 2011 or first day class meets

4) Grading

- a) Worth three homework grades

5) Other

- a) The following websites may be useful for your reference:
 - i) <http://www.themathpage.com/Alg/factoring-trinomials.htm>
 - ii) <http://www.mathwarehouse.com/quadratic/solve-quadratic-equation-by-factoring.php>
- b) There are numerous examples and tutorials arranged by concept at
 - i) <http://www.analyzemath.com/PrecalculusTutorials.html>

Summer Assignment for Trigonometry/Pre-calculus CP

Show all work on separate paper. Clearly label each question and answer.

Families of Graphs

Describe the transformation from the parent function $f(x)$ to the new function $g(x)$

1. $f(x) = x^3$

a. $g(x) = 2x^3$

b. $g(x) = (x + 2)^3 - 4$

c. $g(x) = -(x + 1)^3 + 3$

Use transformations to graph the following

2. $f(x) = (x + 3)^2 - 1$

3. $g(x) = \sqrt{x + 4} - 2$

4. $h(x) = 3|x - 2| + 1$

Inverse Functions and Relations

Graph each function and its inverse

5. $f(x) = (x + 2)^2 - 1$

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

Find the inverse of each function. State if the inverse is also a function.

7. $f(x) = 3x^2 + 2$

$$8. g(x) = \sqrt{2x + 4}$$

$$9. h(x) = \frac{x+3}{2x-2}$$

Continuity and End Behavior

Is the function continuous at the given value of x ?

$$10. f(x) = \frac{2}{x+4}; x = 4$$

$$11. g(x) = \sqrt{2x + 1}; x = -1$$

$$12. s(t) = t^3 - 3t^2 + 2t - 7; t = -2$$

Describe the end behavior of each function (where are the y -values going as x approaches negative or positive infinity?)

$$13. y = 2x^5 + 3x^2 - 7x$$

$$14. y = -x^4 + 3x^3 + 2x^2$$

$$15. y = -2x^3 + 2x^2 - 5x$$

$$16. y = 2x^6 + 3x^5 + 4x^3$$

Critical Points and Extrema

Identify all points at which each function has a maximum or a minimum. It may be necessary to estimate the coordinates. Use a graphing calculator to identify these points from the graph of the function.

$$17. f(x) = x^5 - 2x^3 - 2x^2$$

$$18. r(t) = 2t^4 - 3t^3 + 2t^2 - 7$$

$$19. f(x) = -3x^2 + 2x + 1$$

Graphs of Rational Functions

Find the following characteristics of each function, and sketch the graph: horizontal asymptote, vertical asymptote, slant asymptote, hole, x -intercept, y -intercept. Some functions may have more than one occurrence of these characteristics or none at all.

$$20. f(x) = \frac{3}{x^2+1}$$

$$21. g(x) = \frac{x+3}{x^2+5x+6}$$

$$22. \frac{x+2}{x-4}$$

$$23. \frac{5x^2-10x+1}{x-2}$$

$$24. \frac{x^2+7x+12}{x^2+8x+15}$$

Quadratic Equations

Find the discriminant of each equation and describe what kind of roots the equation will have. Then, solve the equation by using the Quadratic Formula.

$$25. x^2 - 7x + 12 = 0$$

$$26. 2x^2 + 2x - 1 = 0$$

$$27. 3x^2 - 7x = 12$$

$$28. -4x^2 + 2x - 7 = 0$$

Exponential Functions

Graph each function

29. $y = 2^{x+1}$

30. $y = \frac{1}{3}^x$

Solve the following.

31. An investment of \$4500.00 earns 5.2% interest compounded monthly. What will the investment be worth in 3 years?

32. How much money must be invested to have a value of \$15,000.00 after 5 years? The interest is 5% compounded monthly.

33. The population of Hohokus, NJ grows continuously at the rate of 1.2%. If the population is 23,000 in 2010, what will the population be in 2017?

34. What would the population of Hohokus be in 2016 if the population were to decrease at 3.4%?

35. An investment of \$2300.00 earns 2.1% interest. How much more will the investment be worth in 7 years if it is compounded continuously than the same investment if it is compounded quarterly?

Logarithmic Functions

Write each equation in exponential form.

36. $\log_3 81 = 4$

37. $\log_2 \frac{1}{16} = -4$

38. $\log_5 125 = 3$

Write each equation in logarithmic form.

39. $3^{-3} = \frac{1}{27}$

$$40. 2^5 = 32$$

$$41. 4^3 = 64$$

Evaluate each expression.

$$42. \log_6 6^3$$

$$43. \log_2 16$$

$$44. \log_5 5^{x+1}$$

Solve each equation

$$45. \log_x 64 = 3$$

$$46. \log_4(2x - 1) = \log_4 16$$

$$47. \log_7 56 - \log_7 x = \log_7 4$$

$$48. \log_5(x + 4) + \log_5 x = \log_5 12$$

49. An investment earned 4.1% interest compounded continuously for 5 years. The investment was worth \$5300.00 after 5 years. What was the original investment?

50. Find the amount of time it would take for an investment to double at the given rate if the interest is compounded monthly.

a. 4.4%

b. 3.2%

c. 9.1%

d. 25%