

Haddonfield Memorial High School
Summer Assignment Cover Sheet

Course: AP Calculus AB

Teacher(s): Mr. Burns

Due Date(s): 9/7/10

Grade Weight (%) of Quarter 1: 5%

NJ Core

Curriculum Standards:

3.1.12.G.7 Analyze and evaluate figurative language within a text (e.g., irony, paradox, metaphor, simile, personification).

MA.9-12.4.3 - All students will represent and analyze relationships among variable quantities and solve problems involving patterns, functions, and algebraic concepts and processes.

MA.9-12.4.4 - All students will develop an understanding of the concepts and techniques of data analysis, probability, and discrete mathematics, and will use them to model situations, solve problems, and analyze and draw appropriate inferences from data.

Description of Assignment:

General review.

Complete review problems

Purpose of Assignment:

The information included is vital basic content in the course and will help to promote success in the course.

Specific Expectations:

Review Trig-Pre-Calculus and first two chapters of Calculus

Potential Help Sources:

Teacher email

sburns@haddonfield.k12.nj.us

Name _____

AP Calculus AB

Summer Assignment

This assignment is due on the first day of class. It will count as a test grade for the 1st quarter. You may use the internet, any notes from years prior, and each other. Please feel free to email me questions as well. I work over the summer so my responses to your emails may take a few days depending on my schedule.

Please do not wait until the last minute. This is a broad review which you will need to work on over a period of time. You have been taught everything in this packet, but you may not remember everything. It will be necessary to find other sources to review; therefore, waiting until the last minute would not be a good idea.

As a note, though I am allowing you to work with each other, if you copy someone else's work without understanding what he/she did, you will only prepare yourself for failure in this course.

Review of Pre-calculus and Algebra

Draw a complete graph. You must show the x-intercepts, y-intercepts, and any maximum and minimum points.

1. $y = -3x^2 - 6x - 1$

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

Find the equation of a line in point-slope form. There may be more than one answer in point-slope form.

3. a line that passes through (1, 3) and (3, 1)

4. a line that passes through $(-2, 2)$ and is perpendicular to $2x + y = 4$

5. a line that passes through $(1, 0)$ and is parallel to $2x + y = -2$

Find the domain.

6. $y = 4 - x^2$

7. $y = 1 + \frac{1}{x}$

8. $y = \sqrt{-x}$

Even and Odd Functions

9. In mathematical terms, define what an even and an odd function is.

10. Prove that $y = x + x^3$ is an even or an odd function.

Function Notation

Let $f(x) = x + 5$ and $g(x) = x^2 - 3$

11. Find $f(g(0))$.

12. Find $f(f(-5))$.

13. Find $f(g(x))$.

14. Find $g^{-1}(x)$.

Give an equation of the transformed graph of y .

15. $y = |x|$, horizontal shift left 2, vertical stretch by 3, vertical shift up 5,

16. $y = \sqrt[3]{x}$, vertical shrink of 0.3, reflects through the y-axis, horizontal shift right 8, and vertical shift down 7

Review of Logs

Evaluate without a calculator.

16. $\log_2 64$

17. $\log_6 \frac{1}{36}$

18. $\log_8 2$

Express as a single logarithm. You may want to review the properties of logarithms.

19. $2 \ln x - \ln y$

20. $\ln x + 4 \ln y - 6 \ln z$

Solve for x. You must show all work! Calculator answers will not suffice!

21. $e^x = 16$

22. $\ln(2x - 1) = 3$

$$23. 2^{x-5} = 3$$

Review of Trigonometry

Convert Degrees to Radians. Keep in terms of π .

24. 210°

25. 60°

26. 135°

27. 540°

Find sine, cosine, and tangent given the following information.

28. $\sin x = \frac{3}{5}, 0 < x < \frac{\pi}{2}$

29. $\tan x = 2, 0 < x < \frac{\pi}{2}$

30. $\sec x = -1.5, \frac{\pi}{2} < x < \pi$

Using your Trigonometric Identities, Prove.

31. $(\sin x + \cos x)^2 = 1 + \sin 2x$

Finding Exact Values for Special Angles.

32. Complete the table for the Special Angles below. All angles measures are in radians.

Angle	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$
Sin						
Cos						
Tan						

Evaluate using your table. All angles are in radians!

33. $\sin \frac{3\pi}{4}$

34. $\cos \frac{5\pi}{6}$

35. $\tan \frac{2\pi}{3}$

36. $\sin \frac{5\pi}{2}$

37. $\cos 7\pi$

Solve the following equations on the interval $[0, 2\pi)$. Solve in radians!

38. $2\cos x - 1 = 0$

39. $4\tan x - 3 = 1$

40. $\sin^2 x - 1 = 0$

41. $2\cos^2 x + \cos x - 1 = 0$

Calculus Review

Find the limits. You must be able to do these without a calculator. Show all work!

$$42. \lim_{x \rightarrow 2} 2x$$

$$43. \lim_{x \rightarrow -1} (3x(2x-1))$$

$$44. \lim_{x \rightarrow 1} (x^3 + 3x^2 - 2x - 17)$$

$$45. \lim_{x \rightarrow 3} \frac{x^2 + 4x + 3}{x^2 - 3}$$

$$46. \lim_{x \rightarrow 1} \frac{x-1}{x^2-1}$$

$$47. \lim_{x \rightarrow 1} \frac{x^2 - 3x + 2}{x^2 - 1}$$

$$48. \lim_{x \rightarrow 2} \frac{2x-4}{x^3-2x^2}$$

$$49. \lim_{x \rightarrow 0} \frac{(2+x)^3 - 8}{x}$$

Find the limits as x approaches infinity of the following functions.

50. $\frac{2x^3 + 7}{x^3 - x^2 + x + 7}$

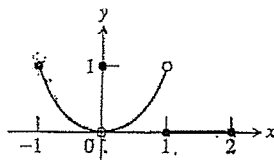
51. $\frac{3x + 7}{x^2 - 2}$

52. $\frac{3x^4 + 1}{x^3}$

53. $\frac{-2x^3 - 2x + 3}{3x^3 + 3x^2 - 5x}$

54. Answer Question 39 from this textbook. Make sure you answer each part!

39. Which of the following statements are true of the function $y = f(x)$ graphed here?



- | | |
|---|--|
| a) $\lim_{x \rightarrow -1^+} f(x) = 1$ | b) $\lim_{x \rightarrow 0^-} f(x) = 0$ |
| c) $\lim_{x \rightarrow 0^-} f(x) = 1$ | d) $\lim_{x \rightarrow 0^-} f(x) = \lim_{x \rightarrow 0^+} f(x)$ |
| e) $\lim_{x \rightarrow 0} f(x)$ exists | f) $\lim_{x \rightarrow 0} f(x) = 0$ |
| g) $\lim_{x \rightarrow 0} f(x) = 1$ | h) $\lim_{x \rightarrow 1} f(x) = 1$ |
| i) $\lim_{x \rightarrow 1} f(x) = 0$ | j) $\lim_{x \rightarrow 2^-} f(x) = 2$ |

Which statements are true of the function