Summer Maintenance Packet
For Students Entering Math Analysis AB and BC Classes
For The 2009-2010 School Year

The enclosed packet is designed as a review/preview for you in preparation for your Math Analysis class next fall. It is recommended that you spend time on it in August as the new school year approaches. It is not designed as a test. You will find an answer sheet for all problems included in the packet. Please **complete the packet and return it, with all accompanying work, to your Math Analysis teacher on the first day of school in September**. It is our hope that a minimum amount of time spent on this work will refresh you on materials you have previously learned and prepare you for a comfortable start to the new year.

Use your notes from this year and your graphing calculator as you see fit. Spending this time will pay dividends in the time to come. (Now, are those dividends compounded continuously, requiring me to use natural logarithms, or …?)

Enjoy your summer,
The Math Department

NAME_____

ALGEBRA 2 REVIEW / MATH ANALYSIS PREVIEW

Follow the directions for each problem. Show all work for each problem in the space provided. Put all answers on the line provided.

1. SUBTRACT AND REDUCE TO LOWEST TERMS: $\frac{1}{X}-\frac{X}{2Y}$

_____

2. EVALUATE: $\frac{1}{81^{\frac{-1}{2}}}$

_____

3. SIMPLIFY: $7\sqrt{25XY^2}-4\sqrt{75XY^2}+2\sqrt{12XY^2}$

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4. MULTIPLY: $(X-2\sqrt{3})(X+2\sqrt{3})$

_____

5. SUBTRACT THEN SIMPLIFY: $\frac{3}{x^2+2x+1}-\frac{1}{x+1}$

_____

6. SIMPLIFY THE COMPOUND FRACTION: $\frac{\sqrt{X}+\frac{6}{\sqrt{X}}}{\sqrt{X}}$

_____

7. FACTOR: $\frac{2}{3}(X+5)^{\frac{4}{3}}-\frac{1}{5}\left(X+5\right)^{\frac{7}{3}}$

_____

8. FACTOR COMPLETELY: $14X^2 - 19X - 3$

_____

9. USE THE DISCRIMINANT TO DETERMINE THE NUMBER OF REAL SOLUTIONS: $4X^2 - 2X - 7 = 0$

_____

10. FIND THE INTERVAL ON WHICH THE EXPRESSION IS DEFINED: $\sqrt{X^2 - 7X - 8}$

_____

11. SOLVE FOR X: $3X^2 = 4X - 2$

_____

12. SOLVE FOR X: $|3X + 10| = 13$

_____

13. SOLVE FOR X: $\sqrt{15X + 4} = 4 - \sqrt{2X + 3}$

_____

14. SOLVE FOR X: $\frac{3X + 5}{X + 7} - 5 = \frac{3}{X}$

_____

15. MULTIPLY, THEN EXPRESS IN STANDARD FORM: $(3 + 7i)(6 - 2i)$

_____

16. DIVIDE, THEN WRITE THE RESULT IN STANDARD FORM: $\frac{6+10i}{2i}$

_____

17. SOLVE FOR X: $\frac{X+16}{3X+2} \leq 5$

_____

18. FIND X SUCH THAT THE DISTANCE BETWEEN THE GIVEN POINTS IS 12: (6, -1) AND (X, 9)

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19. FIND THE X-INTERCEPT(S): $3X^2 + 2Y^2 + 4XY - 12 = 0$

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20. GIVEN $f(X) = X^2 - 3X + 4$, FIND $f(X+2) - f(X)$

_____

21. GIVEN $f(X) = 7X + 2$, FIND $f^{-1}(X)$

_____

22. GIVEN $f(X) = 2X^2 + 1$ AND $g(X) = X + 2$, FIND $(f \circ g)(X)$

_____

23. WRITE THE EQUATION OF THE LINE THAT PASSES THROUGH (1, 3) AND IS PERPENDICULAR TO 2X + 3Y + 5 = 0

_____

24. IS THE FOLLOWING FUNCTION EVEN, ODD, BOTH, OR NEITHER? $f(X) = 3X^4 - X^2 + 2$

_____

25. FIND ALL THE REAL ZEROS OF THE FUNCTION: $f(X) = X^3 - \frac{11}{3}X^2 + \frac{5}{3}X + 1$

_____

26. SOLVE FOR X: $3^{2X} = 81$

_____

27. WRITE IN LOGARITHM FORM: $4^3 = 64$

_____

28. EVALUATE USING THE CHANGE OF BASE FORMULA: $\log_4 7$

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29. SIMPLIFY USING THE PROPERTIES OF LOGS: $\ln(5e^3)$

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30. SOLVE FOR X: $\ln(e^{4x}) = 60$

_____

31. SOLVE FOR ALL ANGLES OVER THE INTERVAL [0°, 360°): $\sin\theta\cot^2\theta = 3\sin\theta$

_____

32. SIMPLIFY THE TRIGONOMETRIC EXPRESSION: csc θ (csc θ – sin θ)

_____

33. USE THE UNIT CIRCLE TO FIND **ALL** THE VALUES, IN RADIANS, THAT SATISFY $\tan\theta = -1$

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34. GIVEN $\tan\theta = \frac{\sqrt{3}}{2}$, FIND $\cot\theta$

_____

35. EVALUATE: $2\sec 0 + 4\cot^2\frac{\pi}{2} + \cos 2\pi$

_____

36. FIND THE COORDINATES OF THE POINT WHERE THE TERMINAL SIDE OF AN ANGLE OF $-\frac{5\pi}{6}$ RADIANS INTERSECTS THE UNIT CIRCLE:

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37. USE THE UNIT CIRCLE TO FIND THE EXACT VALUE OF $\cot(-540^0)$

_____

38. WRITE THE EQUATION OF A SINE FUNCTION WHERE a < 0, THE AMPLITUDE IS 5 AND THE PERIOD IS $\frac{2\pi}{3}$

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39. FIND THE AMPLITUDE AND PERIOD OF THE SINE FUNCTION: $y = 2.25\sin\frac{20\pi}{21}\theta$

_____

40. IF $\cot\theta = \frac{7}{8}$ AND $\csc\theta = \frac{41}{36}$, FIND THE VALUE OF $\cos\theta$

_____

Answers!

1. $\frac{2Y - X^2}{2XY}$

2. 9

3. $35|Y|\sqrt{X} - 16|Y|\sqrt{3X}$

4. $X^2 - 12$

5. $\frac{2 - X}{X^2 + 2X + 1}$

6. $\frac{X + 6}{X}$

7. $(-3X - 5)\frac{(X+5)^{\frac{4}{3}}}{15}$

8. $(2X - 3)(7X + 1)$

9. 2

10. $(-\infty, -1], [8, \infty)$

11. $\frac{2}{3} \pm \frac{\sqrt{2}}{3}i$

12. $1, -23/3$

13. $\frac{11}{169}$

14. $\frac{33 \pm \sqrt{921}}{-4}$

15. $32 + 36i$

16. $5 - 3i$

17. $(-\infty, \frac{-2}{3}), [\frac{3}{7}, \infty)$

18. $6 \pm 2\sqrt{11}$

19. ± 2

20. $4x - 2$

21. $\frac{X - 2}{7}$

22. $2X^2 + 8X + 9$

23. $3X - 2Y + 3 = 0$

24. *EVEN*

25. $1, 3, \frac{-1}{3}$

26. 2

27. $\log_4 64 = 3$

28. 1.4037

29. $3 + \ln 5$

30. 15

31. $30^0, 150^0, 210^0, 330^0$

32. $\cot^2\theta$

33. $\frac{3\pi}{4} + \pi n$

34. $\frac{2\sqrt{3}}{3}$

35. 3

36. $(\frac{-\sqrt{3}}{2}, -\frac{1}{2})$

37. *undefined*

38. $y = -5\sin 3\theta$

39. 2.25 & 2.1

40. $\frac{63}{82}$