Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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PRE-CALCULUS

*Please keep in mind that this exam is worth 20% of your overall grade for this SEMESTER and your semester grade is averaged into your overall GPA.*

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| **Schedule of Assignments** |
| Chapter | Due Date | 🗹 |
| 7 #1-21 | Wednesday, May 25th  |  |
| 7#22-33 | Thursday, May 26th  |  |
| 8 | Friday, May 27th  |  |
| 9 | Tuesday, May 31st  |  |
| 11 | Wednesday, June 1st  |  |
| 12 | Thursday, June 2nd  |  |

**1st Hour Exam: WEDNESDAY, JUNE 8TH (8:00-9:30)**

**6th Hour Exam: FRIDAY, JUNE 3RD (8:00-9:30)**

**7th Hour Exam: FRIDAY, JUNE 3RD (9:40-11:10)**

**Chapter 7 – Analytic Trigonometry**

***Simplify the expression. (Sections 7.1-7.3)***

1. 2. 3.

4. 5. 6.

***Verify the identity. (Sections 7.1-7.3)***

7. 8.

9. 10.

***Use sum/difference identity to find the EXACT value of the expression. (Section 7.2 – NON-CALCULATOR)***

11. 12. 13.

***Use a double angle identity to find and from the given information. (Section 7.3 – NON-CALCULATOR)***

14. ; 15. *x* in quadrant II

***Use a half-angle formula to find the EXACT value of the expression. (Section 7.3 – NON-CALCULATOR)***

16. 17. 18.

***Use the appropriate trigonometric identity to simplify the expression. (Sections7.2 & 7.3 – NON-CALCULATOR)***

19. 20. 21.

***Find the EXACT value of each expression, if it is defined. (Section 7.4 – NON-CALCULATOR)***

22. 23. 24.

25. 26. 27.

***Find all solutions of the equation. Answers must be in radians. (Section 7.5)***

28. 29.

30. 31.

***Find all solutions of the equation in the interval . (Section 7.5)***

32. 33.

**Chapter 8 – Polar Coordinates & Vectors**

***Graph each point and label accordingly. Then convert to rectangular coordinates. (Section 8.1)***

 

 

 

 

 

 

 

 

 

 

 

 0

1. 2.

3. 4.

***A point P(r, θ) is given in polar coordinates. Give two other polar representations of the point, one with r < 0 and one with r > 0. (Section 8.1)***

5. 6.

***Convert the rectangular coordinates to polar coordinates with r > 0 and . (Section 8.1)***

7. 8.

***Express the complex number in polar form. (Section 8.3)***

9. 10. 11.

***Find the product and the quotient . Express your answer in polar form. (Section 8.3)***

12.

***Find the indicated power using DeMoivre’s Theorem. Write your answer in complex number form. (Section 8.3)***

13. 14.

***Express the vector with initial point P and terminal point Q in component form. (Section 8.4)***

15. 16.

***Find* u *+* v*, -3*u *+ 5*v*, (magnitude!), and . (Section 8.4)***

17. 18.

***Find the vector in component form having the given magnitude and direction. (Section 8.4)***

19. 20.

***Find the magnitude and direction (in degrees) of the vector.*** ***(Section 8.4)***

21. 22.

***Find (a) (dot product) and (b) the angle between* u *and* v *to the nearest tenth of a degree. (Section 8.5)***

23. 24.

25. Determine whether and are orthogonal. ***(Section 8.5)***

26. Given , find . ***(Section 8.5)***

27. Find the work done by the force in moving an object from *P*(0, 10) to *Q*(5, 25). ***(Section 8.5)***

28. A constant force moves an object along a straight line from point (2, 5) to the point (11, 13). Find the work done if the distance is measured in feet and the force is measured in pounds. ***(Section 8.5)***

**CHAPTER 9 – Systems, Matrices & Inequalities**

***Solve the system. (Sections 9.1-9.3 – NON-CALCULATOR)***

1. 2.

***For problems #3-10, carry out the operation, if possible, using the given matrices. (Sections 9.5-9.7 – NON-CALCULATOR)***

3. A + B 4. 3C – D

5. DA 6. DE

7. (inverse) 8. (inverse)

9. (determinant) 10. (determinant)

11. Solve the matrix equation A – 2**X** = B for matrix X if .

 ***(Section 9.1 – NON-CALCULATOR)***

12. Solve the system using **inverses** of matrices: ***(Section 9.6)***

13. Solve the system using **Cramer’s Rule**: 6x + 12y = 33 ***(Section 9.7 – NON-CALCULATOR)***

 4x + 7y = 20

**Chapter 11 – Sequences & Series**

***Find the first five terms of the sequence. (Section 11.1)***

1. 2. ;

3. Find the sum:  ***(Section 11.1 – NON-CALCULATOR)***

4. Write the sum using sigma notation: ***(Section 11.1 – NON-CALCULATOR)***

***Determine whether the sequence is arithmetic or geometric. Then find the nth term of the sequence. (Sections 11.2-11.3)***

5. 6. 2, 4, 6, 8, …

7. -12, -8, -4, 0, … 8.

9. The 12th term of an **arithmetic sequence** is 32, and the fifth term is 18. Find the 20th term. **(Section 11.2)**

10. Which term of the **arithmetic sequence** 1, 4, 7, … is 88? **(Section 11.2)**

11. Find the partial sum of the **arithmetic sequence**: **(Section 11.2)**

12. An **arithmetic sequence** has first term and common difference . How many terms of

 this sequence must be added to get 2700? **(Section 11.2)**

13. The first term of a **geometric sequence** is 3, and the third term is . Find the fifth term. **(Section 11.3)**

16. Which term of the **geometric sequence** 2, 6, 18, … is 118,098? **(Section 11.3)**

17. Find the partial sum of the **geometric sequence** 1 + 3 + 9 + + 2187. **(Section 11.3)**

18. Find the sum of the **infinite geometric** *series* **(Section 11.3)**

**Chapter 12 – Limits**

1. For the function g whose graph is given, state the value of the given quantity, if it exists.

 **(Section 12.1)**

a) b) c)

d) e) f)

g) g(2) h) i) g(0)

***Find the limit algebraically. (Section 12.2)***

2. 3. 4.

5. 6. 7.

***Find an equation of the tangent line to the curve at the given point. (Section 12.3 and beyond!)***

8. at (1, 1) 9. at (-1, 1)

***Find the derivative of the function at the given value. (Section 12.3 and beyond!)***

10. at -1 11. at 3

***Find the derivative f’(x) of the function. (Section 12.3 and beyond!)***

12. 13. 14.

33. Find the length of an arc that subtends 34. Find the area of a sector with central angle

 a central angle of in a circle with in a circle with radius 3 mi.

 radius 10 m.

35. A woman is riding a bicycle whose wheels are 28 in. in diameter. If the wheels rotate at

 130 revolutions per minute (rpm), find the speed at which she is traveling in mi/h.

36. A boy rotates a stone in a 3 ft. long sling at the rate of 15 revolutions every 10 seconds.

 Find the linear and angular velocities of the stone.

***Find the amplitude, period, vertical shift, and phase shift of the function. Then graph the function.***

37.

Amplitude:\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Phase Shift:\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Vertical Shift:\_\_\_\_\_\_\_\_\_\_\_\_

***Use the graph to find the amplitude, period, and phase shift of the curve. Then write an equation that represents the curve.***

38. 39.

3

0

-2

2

0

-3

Amplitude:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Amplitude:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Phase Shift:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Phase Shift:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Equation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Equation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Identify whether the graph represents .***

40. 41.

1

-1

1

-1

42. 43.

-1

1

1

--1