Name:_____   Date:_____

Summer 2019 PreCalculus Packet
(for students entering PreCalculus in the Fall)

PreCalculus presents the material which follows the study of Algebra and Plane Geometry and precedes the rigorous study of Calculus. It includes appropriate pre-calculus topics, trigonometry, and analytical geometry.

All students entering PreCalculus must complete this math packet over the summer. It is due on **Friday, September 6, 2019**. Students who submit their packets on the first day of school will earn extra credit.

You will receive **2 grades** for this packet – one grade for completion and another grade for a summative assessment of the material. All problems should be completed with all work shown in a notebook. This will be checked on the first day of school.

In your PreCalculus class, you will be using a calculator often. Therefore, students are encouraged to buy their own **SCIENTIFIC CALCULATOR (Texas Instruments is suggested TI-30XS).** Students are more efficient using a calculator with which they are familiar with.

For more practice or explanation of the skills in the packet, you may use the following as resources:
        www.wolframalpha.com
        www.khanacademy.com

If you lose your packet, there is a copy on the school department website.

Teachers: Ms. Cook   email: Julie.cook@npsd.k12.ri.us
                 Ms. Paesano   email: Delores.paesano@npsd.k12.ri.us

Supplies:

- ✓ Notebook or binder with lined paper
- ✓ Pocket folder
- ✓ Pencils
- ✓ Colored pencils
- ✓ Scientific calculator
- ✓ An enthusiastic attitude!

Name:_____   Date:_____

1. Let A = (-2, -6) and B = (-4, 2). Find:

      a. The length of $\overline{AB}$ b. The coordinates of the midpoint of $\overline{AB}$

2. Find the value of "a" if the point (4, -2) lies on the line $2x + ay = 14$.

3. Solve the equations $2x + 3y = 2 \; and \; 6x - y = -4$ simultaneously.

4. Find the slope and the y-intercept of the line $4x - 2y = 7$.

5. Tell which of the following equations have parallel line graphs and which have perpendicular line

graphs.

           a. $2x + 3y = 1$ b. $y = \dfrac{3}{2}x + 3$ c. $6x - 4y - 10 = 0$

6. Write an equation of the line through (6, -2) and (-3, 1).

7. Write an equation of the line through $(5, 5)$ and parallel to the line $4x + 3y = -2$.

8. Write an equation of the line with x-intercept -3 and y-intercept -5.

9. Write an equation of the vertical line through (4, -2).

10.   a. **Writing** Describe the steps of finding an equation of the perpendicular bisector of a line

    segment.

    b. Write an equation of the perpendicular bisector of the segment joining the points (7,0) and

    (1,8).

For #11-15, express each complex number in form **a + bi**.

11. $\sqrt{-50} - \sqrt{-8}$

12. $(2 + 3i)^2$

13. $\dfrac{1}{2+3i}$

14. i^{17}

15. $4(3 + 2i) - 5(1 - i)$

16. Factor $16x^3 - 2$

For #17-22, solve for x.

17. $x^2 = 144$ 18. $x^2 - 21x = 0$ 19. $x^2 - 4x = 9$

20. $7x^2 - 2 = 5x$ 21. $x^2 + 2x + 2 = 0$ 22. $x^3 - x^2 - 16x + 16 = 0$

23. Find the zeros by using the **quadratic formula.** $f(x) = 3x^2 - 5x + 3$

24. Write a quadratic function in standard form for the set of zeros 2 and -3.

25. Solve by **completing the square.** $x^2 - 16x + 48 = 0$

26. Find the discriminant of $3x^2 - 2x + 2 = 0$ then solve by whichever method seems easiest.

27. Write a quadratic function that fits the set of data: (-1, 8), (0, 6), and (1, 2).

28. Sketch the graph of each parabola. Label the vertex, the axis of symmetry, and the intercepts.

    a. $y = -2(x - 1)^2 + 8$ b. $y = x^2 - 6x + 5$

29. Sketch the graphs of the line $2x - y = -2$ and the parabola $y = -x^2 + 4x + 1$. Find the coordinates

for any points of intersection.

30. Write $5x^3 - x^5 + 8x + 2x^4$ in standard form. Identify the lead coefficient, degree, and number of

terms. Name the polynomial.

31. Simplify. $(5x - 2x^2) - (4x^2 + 6x - 9)$

32. Find the product. $(2x + 5)(x^3 - x^2 + 1)$

33. Divide using synthetic division. $(x^3 - 4x^2 + 3x + 2) \div (x - 3)$

34. Is $(x + 5)$ a factor of $P(x) = 2x^2 + x - 10$