## **RAMAPO-INDIAN HILLS SCHOOL DISTRICT**

Dear Ramapo-Indian Hills Student:

Please find attached the summer packet for your upcoming math course. The purpose of the summer packet is to provide you with an opportunity to review prerequisite skills and concepts in preparation for your next year's mathematics course. While you may find some problems in this packet to be easy, you may also find others to be more difficult; therefore, you are not necessarily expected to answer every question correctly. Rather, the expectation is for students to put forth their best effort, and work diligently through each problem.

To that end, you may wish to review notes from prior courses or on-line videos

(www.KhanAcademy.com, www.glencoe.com, www.youtube.com) to refresh your memory on how to complete these problems. We recommend you circle any problems that cause you difficulty, and ask your teachers to review the respective questions when you return to school in September. Again, given that math builds on prior concepts, the purpose of this packet is to help prepare you for your upcoming math course by reviewing these prerequisite skills; therefore, the greater effort you put forth on this packet, the greater it will benefit you when you return to school.

*Please bring your packet and completed work done on the packet to the first day of class in September.* Teachers will plan to review concepts from the summer packets in class and will also be available to answer questions during their extra help hours after school. Teachers may assess on the material in these summer packets after reviewing with the class.

If there are any questions, please do not hesitate to contact the Math Supervisors at the numbers noted below.

Enjoy your summer!

Ramapo High School Michael Kaplan <u>mkaplan@rih.org</u> 201-891-1500 x2255

Indian Hills High School Amanda Zielenkievicz azielenkievicz@rih.org 201-337-0100 x3355 <u>Directions</u>: Show all work neatly on lined paper without the aid of a calculator. All problems should be completed to the best of your ability.

- 1. Simplify  $8^{\frac{2}{3}}$
- 2. Simplify  $(x 2)^2$
- 3. Simplify (5 2x)(3) (3x + 2)(-2)
- 4. Write the equation of a line passing through (3, 2) with a slope of 4
- 5. Simplify  $3(a^0b^3)^2$
- 6. The graph of  $x^2 y^2 = 10$  is:

a. a circle b. an ellipse c. a hyperbola d. a parabola

- 7. Simplify  $\sqrt{5} + \sqrt{20}$
- 8. Evaluate:  $ac^2 + a^3b$  when a = 2, b = 3, and c = 4
- 9. Solve 2x 3(x 4) = 5
- 10. If  $A = \frac{h}{2}(a + b)$ , solve for *b*.
- 11. If  $y = x^2 + 2x + k$  passes through the point (1, 2), then find the value of *k*.
- 12. Find the points of intersection of the graphs  $y = x^3 4x^2 16x$  and y = 5x.
- 13. Find the center and radius of the circle whose equation is  $(x 2)^2 + (y 3)^2 = 4$
- 14. Find the distance between the points (-3, 3) and (-6, -2).
- 15. Factor the expression  $25x^2 16y^2$ .
- 16. Factor the expression  $3x^2 + 20x + 25$ .
- 17. Factor the expression  $3x^3 39x^2 + 120x$ .
- 18. Determine the domain of the function  $f(x) = \frac{10}{\sqrt{x-5}}$
- 19. If  $f(x) = 1 + 3x^2$ , where  $x \neq 0$ , find  $\frac{f(x+2) f(2)}{x}$
- 20. Simplify the expression  $\left(\frac{5x^{-2}}{4x^2}\right)^{-2}$

21. Evaluate the following using the given value(s) and the fundamental trig identities. Given  $\sin 30^\circ = \frac{1}{2}$  and  $\tan 30^\circ = \frac{\sqrt{3}}{3}$ , evaluate the following a)  $\csc 30^\circ$  b)  $\cot 30^\circ$  c)  $\cos 30^\circ$  d)  $\cot 60^\circ$ 22. Given  $\sec \vartheta = 5$  and  $\tan \vartheta = 2\sqrt{6}$ , evaluate a)  $\cos \vartheta$  b)  $\cot \vartheta$  c)  $\cot (90^\circ - \vartheta)$  d)  $\sin \vartheta$ 

23. From a point on a cliff 75 feet above water level an observer can see a ship. The angle of depression to the ship is 4°. How far is the ship from the base of the cliff?

24. Determine the quadrant in which the angle lies.

a) 285° b) -120° c)  $\frac{5\pi}{4}$  d)  $\frac{-7\pi}{3}$ 

25. Let  $\vartheta$  be an angle in standard position with  $(x, y) = (3, -\sqrt{2})$  a point on the terminal side of  $\vartheta$ . Determine the exact values of the six trigonometric function of  $\vartheta$ .

26. Find the values of the six trig functions of  $\vartheta$  with the given information  $\csc \vartheta = 4$  and  $\cot \vartheta < 0$ 

27. Verify the identity:  $\sec^2 x \cot x - \cot x = \tan x$ 

28. Find all the solutions in the interval  $[0,2\pi)$ :  $\cos^2 x - \cos 2x = 0$ 

29. Find all solutions in the interval  $[0,2\pi)$ :  $\cos 2x + \sin x = 0$ 

30. Simplify completely:  $\sin x - \sin x \cos^2 x$