SUMMER REVIEW PACKET – 2015   **Name: _____**
HONORS PRECALCULUS   **Per: _____ Date: _____**

The problems in this packet are designed to help you review topics that are important to your success in Honors Precalculus. You are expected to show your work for each problem. The problems should be done <u>correctly</u>, not just tried. The packet will be checked and is **due Monday, August 31, 2015**. This packet will be posted on the Magruder web page.

There will be a (closed note) quiz on these topics on Friday, September 4, 2015. This quiz will be a NO CALCULATOR quiz. You can work with one or more people on the packet, but each person has to take the quiz! Have a great summer!

I.   Solve for x, where x is a real number. Show your work!

1. $x^2 + 3x - 4 = 14$ 2. $6x^2 - 5x = 4$

3. $(x-5)^2 = 9$ 4. $2x^2 + 5x = 8$

5. $3x^2 = 12x$ 6. $4x^2 - 3 = 0$

7. $\dfrac{x-1}{5} + 3(x+2) = \dfrac{x}{2}$

8.   Solve: $-4x^3 \geq 16x$

9.   Graph the interval $(-3, 2]$

10. Solve the inequality, and draw a number line graph of the solution.

     $-2 \leq 3x + 4 \leq 5$
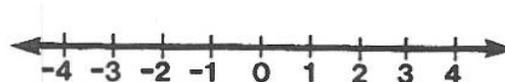
II. Solve for z :

11. $4x + 10yz = 0$

12. $y^2 + 3yz - 8z - 4x = 0$

III.   For each function, determine its **domain** and **range**.

Function:	Domain:	Range:

13. $y = \sqrt{x - 4}$ _____   _____

14. $y = \sqrt{x^2 - 4}$ _____   _____

15. $y = \sqrt{4 - x^2}$ _____   _____

16. $y = \sqrt{x^2 + 4}$ _____   _____

IV.   Given the functions, determine each of the following:

$f(x) = \{(3,5),(2,4),(1,7)\}$ $g(x) = \sqrt{x - 3}$ 17. $h(4) =$ _____

$h(x) = \{(3,2),(4,3),(1,6)\}$ $k(x) = x^2 + 5$ 18. $g(52) =$ _____

19. $f(h(3)) =$ _____   20. $g(k(7)) =$ _____

21. $g(k(x)) =$ _____   22. $k(g(x)) =$ _____

V.   Give the domain and range of each function.

23. $y = x^3$ Domain_____   24. $y = \sqrt{x}$ Domain_____

                         Range_____   Range_____

VI. Graph each function. Give its domain and range.

25.　　$y = e^x$　Domain_____

Range_____
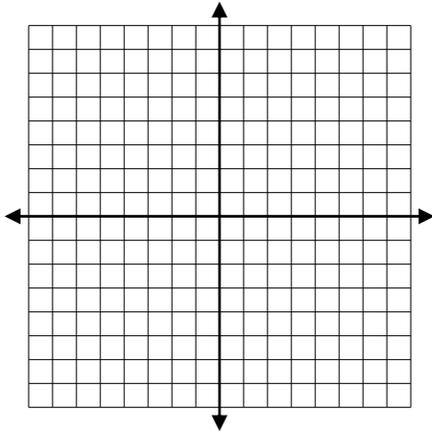
26.　　$y = \ln x$　Domain_____

Range_____
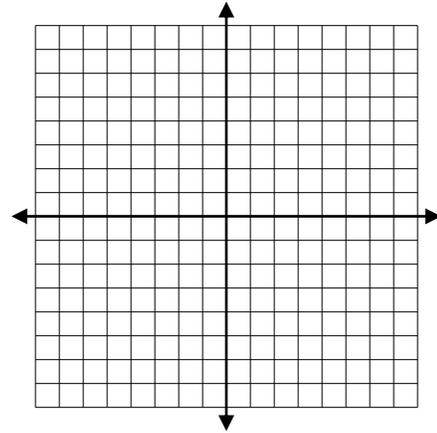
27.　　$y = \dfrac{1}{x}$　Domain_____

Range_____
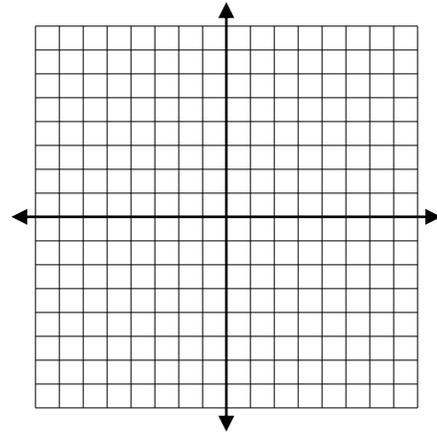
VII. Use the substitution method to solve the linear system.

28.　　$\begin{cases} 6x + y = -2 \\ 4x - 3y = 17 \end{cases}$

VIII. Use the linear combination method to solve the linear system.

29.　　$\begin{cases} 11x + 6y = 1 \\ 3x + 2y = -3 \end{cases}$

IX. Simplify the following rational expressions. Show your work.

30. $\dfrac{x-4}{x^2-3x-4}$

31. $\dfrac{x^3-8}{x-2}$

_____

_____

32. $\dfrac{x-5}{x^2-25}$

33. $\dfrac{x^2-4x-32}{x^2-16}$

_____

_____

X. Exponents and Logarithms. Simplify and evaluate where appropriate.

34. $27^{\frac{2}{3}}$ = _____

35. $\left(5a^{\frac{2}{3}}\right)\left(4a^{\frac{3}{2}}\right)$ = _____

36. $\left(4a^{\frac{5}{3}}\right)^{\frac{3}{2}}$ = _____

37. $\dfrac{\left(2x^2\right)^3 y^2}{x^3 y^4}$ = _____

Solve for x.

38. $\log_5(3x+1)=2$ _____

39. $\log_3(5x-1)=\log_3(x+7)$ _____

40. $\log 5x(x-1)=2$ _____

41. $\ln e^7 = x$ _____

XI. Solve. Your answer may be exact or correct to three places after the decimal point.

42. Evaluate $\dfrac{6(-3.2)-2}{5^2-4^{-2}}$.

43. Write the sum $(3+2i)+(7-5i)$ in standard form.

44. Write the quotient $\dfrac{2+5i}{1-4i}$ in standard form.

45. Write the complex number $\dfrac{2}{3-i}$ in standard form.

46. Determine c so that, in the diagram to the right, the line segment AB is perpendicular to the line segment CD.
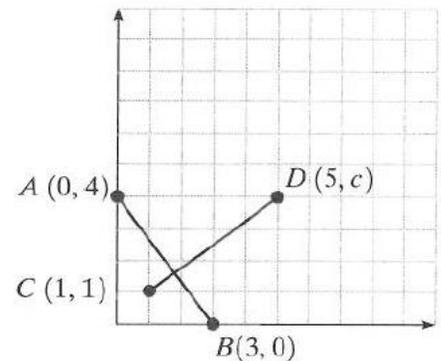
47. A rectangular garden is to be built so that the length of the garden is twice its width. If 24 feet of fencing is available to fence the garden, what should the dimensions of the rectangle be?

48. A projectile launched straight up has height s (in feet) at time t (in seconds) where $s(t)=-16t^2+140t+75$. What is the initial height and the maximum height of the projectile?

49. When Jose bought his car 5 years ago, he paid $16,000 and now it is worth $13,200. Assuming this is a linear relationship, what will his car be worth in another 3 years?