

Dear 2018-2019 Honors Pre-Calculus Student,

5/17/2018

Attached is the required summer algebra packet that all students in Honors Pre-Calculus will be expected to work on and complete by the first day of school in August. All topics are taken directly from the Honors Algebra 1 Curriculum and a working knowledge of each topic will be helpful in having a successful experience in Honors Pre-Calculus. This packet is meant to serve as a “refresher” exercise from the curriculum that was learned in Honors Algebra 1. Furthermore, this packet will serve as an indication of topics that need to be looked at and understood if you did not take Honors Algebra 1 at RB.

All Packets will be turned in on the 1st day of school and will be graded for completion and effort. There will be a “Summer Packet Quiz” early on in the school year, as well. All students should work through the packet to the best of their ability. Please use the internet or any teacher of Honors Pre-Calculus as a resource, if needed. Also, do not assume that all solutions will work out to be nice and neat integers. There are many answers that are rational (aka: fractions) results and even some irrational (aka: number under a radical) solutions.

Have an enjoyable summer and we look forward to seeing you next August in Honors Pre-Calc!

Sincerely,

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Summer Packet Topics

#1-5	Evaluating Functions
#6-9	Solving Equations
#10-11	Solving Inequalities
#12-21	Linear Functions
#22-23	Systems of Equations
#24-27	Simplifying Expressions
#28-29	Synthetic Division
#30-41	Factoring
#42	Function Combination
#43	Area
#44-48	Domain
#49-50	Fraction Simplification and Solving
#51-52	Simplifying Radicals
#53-54	Conjugates
#55-57	Completing the Square
#58-60	Quadratics
#61-68	Interpreting Graphs

1) Evaluate: $f(x) = -x^2 - 2x + 4$ for $x = -3$.

For 2-5 evaluate the given function.

$$f(x) = -x^2 + 5x - 6$$

2) $f(2)$

3) $f(-3)$

4) $f(c)$

5) $f(x-2)$

6) Solve: $2 - 3(x - 7) = x + 1$.

7) Solve: $\frac{-x+2}{2} + 1 = -\frac{4x}{7}$.

7) Solve: $f_s = \sqrt[3]{\frac{30}{v}}$ for v.

8) Solve: $\sqrt{2x+6} - \sqrt{x-1} = 2$.

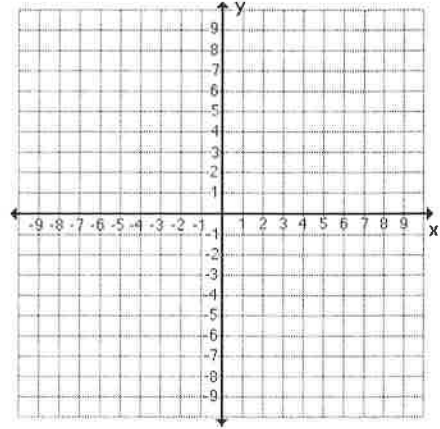
9) Solve: $(3x+4)^2 = -36$.

10) Solve: $-40x - 42 \leq -6(5x - 3)$.

11) Solve: $x + 6 > 4$ or $2 - x > 6$.

For Question 12 Graph the function. State the domain and range in interval notation.

12) $y = \frac{-1}{3}x - 4$



13) Find the slope between $(-2, -5)$ and $(3, 8)$.

14) Find the equation of the line through the point $(-2, 0)$ and with slope $-\frac{1}{8}$.

15) Find the slope of a line that is **perpendicular** to $5x + 3y = 8$.

16) Decide whether the relation defines a function and find its domain D .
 $\{(-2, 4), (1, -9), (5, -7), (9, -3), (12, -3)\}$.

Find the slope and y-intercept for the following linear equations.

17) a. $-4x + 5y - 6 = 0$

b. $6x - 5y = -11$

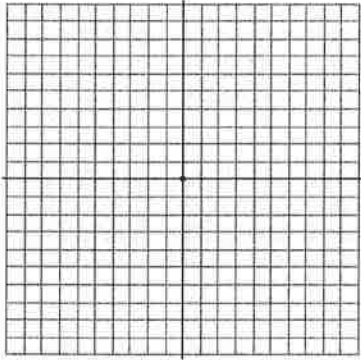
Write the linear equation in slope-intercept form for an equation with:

18) a. Slope = -2 and Passing through $(2,1)$

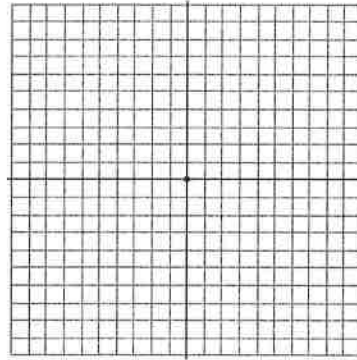
b. Slope = $\frac{1}{2}$ and Passing through $(-4, \frac{1}{3})$

Sketch a graph of the following linear equations.

19.) a. $y = 2x - 5$



b. $3x - y = -4$



Determine whether the following lines are parallel perpendicular or neither.

20.) a. $y = \frac{1}{7}x + 4$ and $y = -7x - 2$

b. $y = 3x - 5$ and $y = \frac{1}{3}x + \frac{1}{5}$

Determine the slope between the following points, and then write the equation in *point-slope* form.

21.) $(-4, -3)$, $(10, 4)$

For questions 13 & 14 solve the system.

$$22) \begin{cases} 2x - 5y = -5 \\ 5x + 3y = 11 \end{cases}$$

$$23) \begin{cases} 3x - 4y = -10 \\ 5x + 9y = -24 \end{cases}$$

$$24) \text{ Simplify: } (9x^7 - 1 - 9x^6) - (-4 + 6x^6 + 3x^7 - 9x^5)$$

$$25) \text{ Simplify: } (8a - 3y)^2$$

$$26) \text{ Simplify; } \frac{21x^{-9}y^3z}{9xy^{-7}z^4}$$

$$27) \text{ Simplify; } (2 - 8i)^2$$

For questions 28 & 29 use synthetic division to simplify.

$$28) (2x^4 - 3x^3 - 12x - 11) \div (x - 4)$$

$$29) (3x^3 - 8x^2 - 100) \div (x + 2)$$

For question 30 – 35 factor COMPLETELY

30) $10a^3 - 25a^2b - 12ab^2 + 30b^3$.

31) $-16x^3y^3 + 4xy^3$

32) $g^2 - 18g + 81$

33) $3x^2 - 3x - 18$

34) $7 + 33y - 10y^2$

35) $108x^3 + 4y^3$

36) Solve; $4k^2 - 23k - 6 = 0$.

37) Simplify; $\frac{x^2 - 4x - 21}{x^2 - 49}$.

37) Simplify; $\frac{z^2 + 10z + 24}{z^2 + 11z + 28} \div \frac{z^2 + 6z}{z^2 - z - 56}$.

38) Simplify; $\frac{3}{y^2 - 3y + 2} + \frac{5}{y^2 - 1}$.

39) Solve; $x^2 + x + 6 = 0$.

40) Solve; $x^4 - 5x^2 - 36 = 0$.

41) Find the x-intercepts of: $f(x) = x^2 - x - 12$.

42) For the functions $f(x) = 3x^2 + 3$ and $g(x) = 5x^3 + x^2 - 2x - 3$; find

a) $(f - g)(x)$

b) $(g / g)(x)$

c) $(f \bullet g)(x)$

43) A certain rectangle's length is 7 feet longer than its width. If the area of the rectangle is 330 square feet, find the dimensions.

44) The domain of the rational expression $\frac{x-3}{3x^2+14x+8}$ is all real numbers except.

45) Find the domain; answer in interval and set builder notation; $f(x) = \sqrt{5x-2}$.

Use your calculator to find the domain and range for the following functions.

46) $f(x) = 3x - 11$

47) $f(x) = x^2 - 5$

48) $f(x) = \frac{1}{x-2}$ (give only domain)

D: _____

R: _____

49) Simplify; $\frac{4 + \frac{2}{x}}{\frac{x}{3} + \frac{1}{6}}$.

50) Solve; $\frac{8}{x+3} - \frac{3}{x-3} = \frac{15}{x^2-9}$.

51) Simplify; $8\sqrt{3} - 4\sqrt{45} + 5\sqrt{243}$

52) Simplify; $\sqrt[3]{-54a^{22}b^7}$.

53) Simplify; $\frac{2+\sqrt{5}}{2-\sqrt{5}}$.

54) Simplify; $\frac{2+i}{5-i}$.

55) Complete the square.; $2x^2 - 20x + 8$.

56) Solve by **Completing the Square**: $x^2 - 5x - 3 = 0$

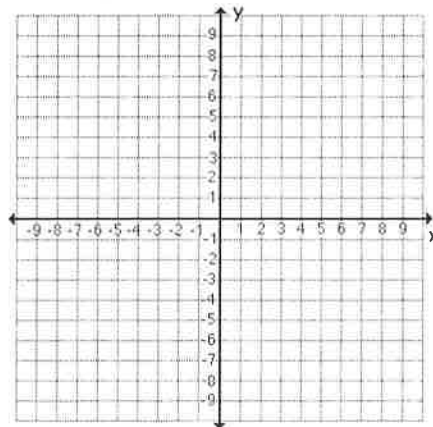
57) Convert $y = 3x^2 + 12x - 7$ to vertex form and label the vertex (h, k) .

58) Based on the discriminant of the following quadratic equation, determine the number and nature of the solutions: $4x^2 - 12x = -9$.

59) Determine whether the function has a maximum or a minimum. Then find the maximum or minimum value. $h(x) = 4x^2 + 16x - 3$.

For Question 60 Graph the function. State the domain and range in interval notation.

60) $y = 4x^2 - 4x - 3$

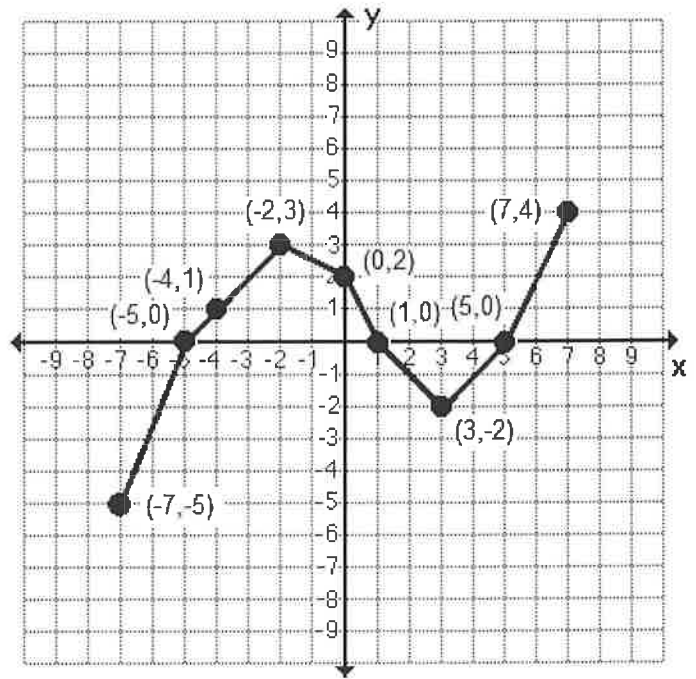


Use the graph of the function $f(x)$ shown to answer questions 49 – 56.

61. Find $f(3)$.

62. Is $f(-4)$ positive or negative?

63. For what number(s) x is $f(x) = 0$?



64. In interval notation, what is the domain of f ?

65. In interval notation, what is the range of f ?

66. What are the x -intercept(s)?

67. What are the y -intercept(s)?

68. For what number x is $f(x) = -5$?