

# Washington Latin Honors Pre-Calculus

## 2022 Summer Review

Name:

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**Read these instructions very carefully, before you start your work !!**

Answer the questions and perform the operations indicated in each problem in this packet. When doing your work, the following are my requirements:

- I will collect this packet on the first day back in school from summer vacation. It will be graded and recorded as a quiz. I recommend that you do not leave it until the last night.
- You may collaborate with classmates, parents, brothers or sisters and so on. You may also look at your notes and other helpful resources. You may not use online graphing or problem-solving sites.
- You may not use calculators.
- I do not want to see any decimal values. Use fractions only.
- Your work must be done in pencil. If there is any pen at all on this packet, including your name, you will get a 0.
- Your graphs must have labelled axes, a clear scale and arrows on all lines that are infinite, including the axes.
- Show your work. An answer, without any work is not acceptable, unless it is such a simple problem it can easily be done in one simple mental step.
- If you are unable to print this packet, you may do your work on separate paper. If you use separate paper, you must copy the original problem from the packet.

1. Explain the following terms as if you were explaining them to a sibling or a cousin, who is in eighth grade. Be simple, clear and accurate.

circle:

dependent variable:

domain of a function:

expression:

factor:

integer:

linear equation:

ordered pair:

parabola:

quadratic:

range of a function:

real number:

slope:

square root:

variable:

2. perform the following operations.

a.  $\frac{1}{2} + \frac{1}{3}$

b.  $\frac{3}{2} + \frac{7}{6}$

c.  $\frac{5}{6x} - \frac{3}{2x}$

d.  $\frac{1}{2y} + \frac{1}{2}$

e.  $\frac{3}{a} + \frac{2}{b}$

f.  $\frac{2y}{10} - \frac{3y}{11}$

g.  $\frac{a}{b} \times \frac{5}{7}$

h.  $\frac{x}{y} \times \frac{y}{x}$

i.  $\frac{2x}{3y} \times \frac{12y}{2b}$

j.  $\frac{a+b}{27} \times \frac{9x}{a+b}$

k.  $\frac{\frac{2x}{5}}{\frac{x}{15}}$

l.  $\frac{1}{4} - \frac{2}{3} + \frac{5}{7}$

3. Find the equations of the following lines:

a. passes through (2, 1) and (7, 11).

b. has a slope of -3, and a *y* - intercept of 10.

c. has an  $x$  - *intercept* of 4 and a  $y$  - *intercept* of - 2.

d. is parallel to the line  $y = - 2x + 3$  and goes through the point (2, 7).

4. Solve the following for  $x$ :

a.  $2x + 13 - 7 = x + 2(31 - x)$

b.  $|x + 13| - 3 = 17$

c.  $|2x - 14| \leq 10$  Illustrate your solution on a number line.

5. Solve the following systems of equations:

a.  $y = 2x - 7$   
 $y = 4x + 6$

b.  $2x + 4y = 12$   
 $4x - y = 6$

6. Factor the following expressions:

a.  $x^2 + 4x + 3$

b.  $x^2 - 5x - 6$

c.  $x^2 + 4x - 12$

d.  $3x^2 - 12x + 9$

e.  $x^2 - 49$

f.  $a^2 + 2ab + b^2$

7. Solve the following equations for  $x$ :

a.  $x^2 + 7x + 12 = 0$

b.  $x^2 - 4x - 12 = 0$

c.  $x^2 - 14x - 45 = 0$

d.  $4x^2 - x - 6 = 0$

e.  $7(x - 4)(x + 3) = 0$

f.  $5(x - 4)^2 - 30 = 0$

8. Simplify the following rational expressions:

a.  $\frac{4x^2}{4x^3 + 12x}$

b.  $\frac{x^2 - 9}{x + 3}$

c.  $\frac{x^2 - 2x - 3}{x^2 - 7x + 12}$

d.  $\frac{x-7}{x^2-49}$

9. Simplify the following exponential expressions:

a.  $10^3 \times 10^2$

b.  $\frac{a^5 \times a^{-3}}{a^2}$



c.  $(10^3)^4 \cdot 10^{-10}$

d.  $\frac{3^5 \cdot 7^4 \cdot 5^2}{7^2 \cdot 5^2 \cdot 4 \cdot 7^2 \cdot 27}$

10. What are the area and the circumference of a circle in terms of its radius?

11. What are the volumes of a cone and a sphere?

12. What is the geometric definition of  $\pi$ ?

13. What are the areas of:

a square --

a rectangle --

a parallelogram --

a trapezoid --

and a triangle --

14. What do we mean when we say that geometric shapes are similar --

congruent --

15. What are the squares of the numbers 1 - 15?

1 -            2 -            3 -            4 -            5 -

6 -            7 -            8 -            9 -            10 -

11 -           12 -           13 -           14 -           15 -

16. What are the divisibility rules for,  
2 -

3 -

4 -

5 -

6 -

9 -

17. What is the hypotenuse of the right triangle with the following pairs of legs?

3, 4

5, 12

7, 24

8, 15