

Dear 2019 - 2020 Pre-Calc (UW Math 120) student,

We are so excited to have you in Pre-Calculus next year! The summer homework assignment (called the Get-Ready Worksheet is OPTIONAL, at least during the summer. You will have a quiz on Algebra skills that are attached on the first Friday of fall classes, September 6. There will be time provided to reacquaint with the material on the first two days of classes. However, if you feel like you might need or want more review time to be confident, feel free to devote yourself to the attached summer homework sheet. Again, to be clear, THIS IS OPTIONAL WORK OVER THE SUMMER.

Answers to this 'Get Ready' Worksheet are posted on the Shorecrest Math website for quick verification of your work.

Students frequently ask us "What is the best way I can prepare for Pre-Calc?" The most direct answer is to be very competent with your Algebra skills, especially those from Algebra 2. This work sheet (re)familiarizes you with many of the Algebra skills you want to have a really good command of. If there were particular chapters from Algebra 2 that did not go well for you, the conscientious student should revisit those topics and get better at them. Khan Academy can be a great resource for reteaching and practice.

Good luck, and have a great summer!

- Mr. Gallagher, Mr. Mann, and Ms. Hinman

# Pre -Calculus Get-Ready Worksheet Name\_\_\_\_\_

You will earn assignment points based on how much you have completed. You are welcome to use other resources (textbooks, on-line resources, people, etc.) to review if needed. The purpose of this work is to ensure that you can recall the concepts needed to be successful at pre-calculus.

In this course, you will not be able to use a graphing calculator. It would be preferred if you start on this technology requirement by using only a scientific calculator when responding to this problem set.

**Do ALL of your work on another piece of paper and attach it to this worksheet.**

**Reminder: This is NOT a test.** This is preparation for pre-calculus so please use other resources TO LEARN how to do any problems you couldn't automatically do. It will not help you to copy work that you don't understand. It is very important that you know as much as you can when school starts.

1. Simplify each expression.

a.  $(2x^3 + 6x - 5) + (3x^2 - 2) - (4x^2 - x)$

b.  $-4xy^3 + x^2y + 3x^3y - 2xy^3 + 5x^3y$

c.  $\frac{9b^2 - 15ab}{-5a + 3b}$

d.  $(x + 4)(x - 6)$

e.  $\frac{a^{\frac{1}{4}} \cdot a^{\frac{1}{2}}}{a^2}$

f.  $49^{\frac{1}{3}} \cdot 49^{\frac{1}{2}}$

2. *Multiple Choice:* Which of the following expressions are equivalent to  $3x^2 + 6x + 2$ ?

a.  $3x^2(x - 2)$

b.  $\frac{3x^2 + 6x - 24}{x + 4}$

c.  $(2x^2 + 3x) + (x^2 + 2x - 2)$

d.  $(5x^2 + 4x) - (2x^2 - 2x - 2)$

3. *Multiple Choice:* Which of the following expressions are equivalent to  $\sqrt{x^2 - 10x + 25}$  ?

a.  $|x - 5|$

b.  $|x + 5|$

c.  $(x - 5)^2$

d.  $(x + 5)^2$

4. Simplify by dividing.

a.  $\frac{16y^3 + 12y^2 - 4y}{4y}$

b.  $\frac{3m - 6}{3mn} \div \frac{m^2 - m - 2}{mn + n}$

c.  $\frac{4x^2 - 4}{x^2 - 2x + 1}$

d.  $\frac{2x^2 - 8}{4x^2 - 12x + 8}$

5. Simplify by multiplying.

a.  $-3x^3y^2(-xy^3 - 5x)$

b.  $(x - 6)(x^2 + 2x - 3)$

6. Factor and solve.

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

b.  $x^2 + 3x - 40 = 0$

7. Solve for x. Leave in reduced radical form.  $3x^2 + 12x - 7 = 0$

8. Simplify. You may need to use common denominators, factoring, etc.

a.  $\frac{1}{a+1} - \frac{1}{a}$       b.  $\frac{\frac{1}{x} + \frac{1}{y}}{\frac{3}{2x} + \frac{3}{2y}}$       c.  $\frac{4n+2}{16-n^2} + \frac{4}{n-4}$       d.  $\frac{6x-15}{5x} \cdot \frac{5x^2-20}{2x^2-x-10}$

9. Rewrite as a simplified radical or with fractional exponents.    a.  $n^{\frac{5}{4}}$       b.  $r^{\frac{5}{2}}$       c.  $\sqrt[5]{64}$

10. Simplify. Reduce radicals in your answer as much as possible.

a.  $\sqrt{288} + \sqrt{50} - \sqrt{27}$       b.  $\frac{\sqrt{24x^2}}{\sqrt{16x^4}}$       c.  $3\sqrt{24}(2\sqrt{18} - 4\sqrt{8})$

11. Solve the equation. Check for extraneous solutions.

a.  $4|x + 6| = 12x - 8$       b.  $-(2 - r) + 8 = -5r + 30$

12. Solve for  $v$ .  $E = \frac{1}{2}mv^2$

13. What is the equation of the line that is perpendicular to  $x - 2y = 5$  and passes through  $(1, -9)$ ?

14. What is the slope and y-intercept of  $2x - 5y = 6$  ?

15. Graph on an x-y axis. Label important parts of your graph.

a.  $y = |x + 1| - 1$       b.  $y = (x - 2)^2 + 1$       c.  $y = -x^2 - 10x - 26$

16. Find the vertex.

a.  $y = x^2 - 12x + 36$       b.  $y = x^2 + 16$       c.  $f(x) = 3|x + 1| + 2$

17. What are the x and y-intercepts of  $f(x) = x^2 + 6x + 9$  ?

18. A scientist adds 20 milliliters of pure alcohol to a 150-milliliter mixture that is 15% alcohol. What percent of alcohol is in the resulting mixture?

19. Luis has 80 yards of fencing to enclose three sides of a rectangular garden. A retaining wall will form the fourth side of the rectangle (he doesn't need a fence for this side). What are the dimensions of the maximum area that Luis can enclose?

20. Find  $(f \circ g)(x)$  and state its domain. Then find  $(f \circ g)(-3)$ .       $f(x) = 2x^2$        $g(x) = x + 1$

21. Find the inverse of  $-4x - 2y = 10$

22. **Multiple Choice:** Which of the following multipart functions best represent the graph?

a.  $f(x) = \begin{cases} x & \text{if } x < 0 \\ x^2 & \text{if } 0 \leq x \leq 2 \\ 6 & \text{if } x > 2 \end{cases}$       b.  $f(x) = \begin{cases} x & \text{if } x \leq 0 \\ x^2 & \text{if } 0 < x < 2 \\ 6 & \text{if } x \geq 2 \end{cases}$

c.  $f(x) = \begin{cases} 1 & \text{if } x < 0 \\ 2x & \text{if } 0 \leq x \leq 2 \\ 6 & \text{if } x > 2 \end{cases}$       d.  $f(x) = \begin{cases} 1 & \text{if } x \leq 0 \\ 2x & \text{if } 0 < x < 2 \\ 6 & \text{if } x \geq 2 \end{cases}$

