

**FOR ALL STUDENTS TAKING CALCULUS
2021-2022**

SUMMER REVIEW PACKET

NAME _____

To all Orangeburg Prep Math Students:

In an effort to continue to improve our standardized test scores and prevent knowledge loss over the summer break, you are asked to complete the attached worksheets and be prepared to turn them in on the first day of classes. The questions in the packet focus on the skills you were taught in your previous math courses. Some problems may be a bit involved, so it is not a good idea to wait until the last minute.

Work needs to accompany each problem and all answers should be in simplified form. The PRINTED packet is due at the beginning of class on Aug. 19 and will be counted as a project grade. A score of 80% will be given if every problem is attempted. Additional points, up to 20%, will be given for accuracy.

You will also be given a quiz on this packet during the first week of school, so make sure to bring questions that you have during Open House on Aug. 17. Any assignment not turned in on time will receive a 10 point deduction for each day that it is late.

Enjoy your summer vacation and your math packet. We look forward to a great school year starting in August.

The Math Department

HONOR CODE: I promise that I completed this summer review packet independently from any other student. I used only the resources given in this packet. **I did NOT use Photomath or any similar program!**

PARENT: _____

STUDENT: _____

Helpful Websites

www.regentsprep.org

www.khanacademy.org

www.purplemath.com/modules

www.Aleks.com (a website where you can subscribe for individual math lessons)

I. Simplify. State any restrictions on x .

1. $\frac{x-4}{x^2-3x-4}$

2. $\frac{x^3-8}{x-2}$

3. $\frac{5-x}{x^2-25}$

II. Simplify. State any restrictions on x . Assume $x \neq 0$ and $h \neq 0$.

1. $\frac{1}{x+h} - \frac{1}{x}$

2. $\frac{\frac{1}{x+3} - \frac{1}{3}}{x}$

III. Find $\frac{f(x+h)-f(x)}{h}$ for the given function f . Assume that $h \neq 0$.

1. $f(x) = 9x + 3$.

2. $f(x) = 5 - 2x$

IV. Simplify.

1. $\ln 1$

2. $\ln e^7$

3. $e^{\ln 3}$

4. $\log_3\left(\frac{1}{3}\right)$

5. $\log_{\frac{1}{2}}(8)$

6. $27^{\frac{2}{3}}$

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

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

V. Using point-slope form $y - y_1 = m(x - x_1)$, write an equation for the line:

1. With slope -2 , containing the point $(3, 4)$.

2. Containing the points $(1, -3)$ and $(-5, 2)$.

3. With slope 0 , containing the point $(4, 2)$.

VI. Determine the exact value for each using the unit circle.

1. $\sin 0$

2. $\sin \frac{\pi}{2}$

3. $\csc \frac{3\pi}{4}$

4. $\cos(-\pi)$

5. $\sec \frac{7\pi}{6}$

6. $\tan \frac{3\pi}{2}$

7. $\cot \frac{\pi}{6}$

VII. Determine all points of intersection algebraically.

1. $f(x) = x^2 + 3x - 4$ and $g(x) = 5x + 11$

2.
$$\begin{cases} x + y = 8 \\ 4x - y = 7 \end{cases}$$

VIII. Convert the given angle from radians to degrees.

1. $\frac{5\pi}{6}$

2. $\frac{4\pi}{5}$

IX. Convert the given angle from degrees to radians.

1. 45°

2. -12°

X. Given that $f(x) = 2x + 1$ and $g(x) = 2x^2 - 1$, find each of the following:

1. $f(2)$

2. $g(-3)$

3. $f(t+1)$

4. $f(g(-2))$

5. $g(f(m+2))$

XI. Factor.

1. $4a^2 + 2a$

2. $x^2 + 16x + 64$

3. $2x^2 - 40x + 200$

4. $x^3 - x^2 + 3x - 3$ (use the rational root/zeros theorem and remainder theorem)

XII. Find the inverse. State the domain and range of $f^{-1}(x)$.

1. $f(x) = 4x - 3$

2. $f(x) = \frac{1}{x-1}$

XIII. Solve each of the following polynomial inequalities using sign charts.

1. $x^2 - 16 > 0$

2. $x^2 + 6x - 16 \geq 0$

3. $2x^2 - 13x - 7 \leq 0$

XIV. Simplify using trigonometric identities.

1. $\frac{\cos x}{\sec x} + \frac{\sin x}{\csc x}$

2. $\frac{\sec^2 x}{\tan x} - \tan x$

3. $\sin 3\theta \cos \theta - \cos 3\theta \sin \theta$

XV. Simplify.

1. Given $F(x) = \frac{x^5}{5} - 2x^4 + \frac{16x^3}{3}$, evaluate $F(4) - F(1)$.

2. Given $G(x) = \frac{1}{3}x^3$, evaluate $G(4) - G(2)$.