Summer Work for Honors Calculus 2023 (349) Due: Friday September 1, 2023

Name_____

This packet contains problems involving skills you should already know. Please take your time with these problems and SHOW YOUR WORK. Do not use a calculator unless otherwise noted. Use online resources to help you if you forget how to work out a problem.

A. Simplify. Show the work that leads to your answer.

1) $\dfrac{x-4}{x^2-3x-4}$

2) $\dfrac{5-x}{x^2-25}$

B. Simplify each expression in order to obtain a single fraction. Show all work.

1) $\dfrac{1}{x+h}-\dfrac{1}{x}$

2) $\dfrac{\frac{2}{x^2}}{\frac{10}{x^5}}$

C. If $f(x)=1-x^2$ and $g(x)=2x+1$, find:

1) $f(g(x))$

2) $\dfrac{g(x+h)-g(x)}{h}$

3) $g(f(4))$

D. 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) _____

4) perpendicular to the line in #1, containing the point (3, 4) _____

E. Find the equation of all vertical ($x = ?$) and horizontal ($y = ?$) asymptotes, if they exist.

1) $y = \dfrac{x}{x-3}$

2) $y = \dfrac{x^3 + 4}{x^2 - 1}$

F. For each of the following, sketch the function and then determine its domain and range.

1) $y = \dfrac{1}{x+1}$

2) $y = 3\sin 2x$

G. Complete the following identities.

1) $\sin^2 x + \cos^2 x =$ _____

2) $1 + \tan^2 x =$ _____

H. Factor the following completely.

1) $2x^2 - 13x - 15$

2) $t^4 - 13t^2 + 36$

I. Multiply and simplify your results.

1) $\dfrac{6s^2}{5t^3} \bullet \dfrac{10st}{6s^3}$

2) $\dfrac{x^2-4}{6} \bullet \dfrac{2x-4}{x+2}$

3) $\dfrac{3y+9}{14y} \bullet \dfrac{y^3}{y^2-9}$

J. Determine the exact value of each expression. Remember NO CALCULATORS!

1) $\sin 0 =$ _____

2) $\sin \frac{3\pi}{4} =$ _____

3) $\cos \pi =$ _____

4) $\cos \frac{7\pi}{6} =$ _____

5) $\tan \frac{7\pi}{4} =$ _____

6) $\tan 0 =$ _____

7) $\csc \frac{2\pi}{3} =$ _____

8) $\sec \frac{3\pi}{2} =$ _____

9) $\cot \frac{11\pi}{6} =$ _____

10) $\sin \frac{-\pi}{3} =$ _____

11) $\cos \frac{-\pi}{2} =$ _____

12) $\arcsin \frac{\sqrt{3}}{2} =$ _____

13) $\tan^{-1}(-1) =$ ____

14) $\arccos(1) =$ _____

15) $\arcsin\left(-\frac{1}{2}\right) =$ _____

K. Solve the equation for x, where x is a real number.

1) $5\ln(2x+1) - 3 = 6$

2) $\frac{4}{x-1} - \frac{1}{6} = \frac{5}{x+3}$

L. Solve each equation on the interval $[0, 2\pi)$.

1) $4\sin^2 x = 1$

2) $2\cos x + \sqrt{3} = 0$

M. Rewrite to solve for z.

1) $4x + 10yz = 0$

2) $h = \sqrt[3]{\frac{2x^4}{z}}$

Answer sheet for Calculus. Name_____

A.

1._____

2. _____

B.

1._____

2. _____

C.

1._____

2. _____

3._____

D.

1._____

2. _____

3._____

4._____

E.

1._____

2. _____

F.

1._____

2. _____

G.

1._____

2. _____

H.

1. _____

2. _____

I.

1. _____

2. _____

3._____

J.

1. _____

2. _____

K.

1._____

2. _____

3._____

4._____

5._____

6. _____

7._____

8._____

9._____

10._____

11._____

12._____

13._____

14._____

15._____

L.

1._____

2. _____

M.

1._____

2. _____

6._____

7._____