

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) $\frac{x-4}{x^2-3x-4}$

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

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

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

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

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

1) $f(g(x))$

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

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) $y = \frac{x}{x-3}$

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

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

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

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) $\frac{6s^2}{5t^3} \cdot \frac{10st}{6s^3}$

2) $\frac{x^2 - 4}{6} \cdot \frac{2x - 4}{x + 2}$

3) $\frac{3y + 9}{14y} \cdot \frac{y^3}{y^2 - 9}$

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. _____

L.

1. _____

2. _____

M.

1. _____

2. _____

9. _____

10. _____

11. _____

12. _____

13. _____

14. _____

15. _____

6. _____

7. _____