Paint Branch High School

Calculus with Applications

Summer Pre-View Packet

DUE THE FIRST DAY OF SCHOOL

The problems in this packet are designed to help you review topics from previous mathematics courses that are important to your success in *Calculus with Applications.*

DO ALL PROBLEMS WITHOUT A CALCULATOR. Show all work that leads you to each solution on separate sheets of paper. You may use your notes from previous mathematics courses to help you. You must do all work without any help from another person.

All work should be completed and ready to turn in on the FIRST DAY of school. This packet will count as part of your first quarter grade.

ENJOY YOUR SUMMER! WE ARE LOOKING FORWARD TO SEEING YOU IN THE FALL.

Student Name: _____

Date: _____ / _____ / _____

Calculus with Applications Summer Review

Name _____

USE A SEPARATE SHEET OF PAPER TO SHOW ALL WORK THAT LEADS TO YOUR ANSWER.

1. Simplify.

a) $\dfrac{x-4}{x^2-3x-4}$ b) $\dfrac{x^3-8}{x-2}$ c) $\dfrac{5-x}{x^2-25}$

2. Trigonometric Pythagorean Identities: a) $\sin^2 x + \cos^2 x =$ _____

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

c) $\cot^2 x + 1 =$ _____

3. Simplify each expression. Write answers with positive exponents where applicable:

a) $\dfrac{1}{x+h} - \dfrac{1}{x}$ b) $\dfrac{\frac{2}{x^2}}{\frac{10}{x^5}}$ c) $\dfrac{12x^{-3}y^2}{18xy^{-1}}$ d) $(5a^{\frac{2}{3}})(4a^{\frac{3}{2}})$ e) $(4a^{\frac{5}{3}})^{\frac{3}{2}}$

f) $\log\dfrac{1}{100}$ g) $\ln e^7$ h) $27^{\frac{2}{3}}$ i) $\log_{1/2} 8$ j) $x^{3/2}(x+x^{5/2}-x^2)$

5. Given: $f(x) = \{(3, 5), (2, 4), (1, 7)\}$, $g(x) = \sqrt{x-3}$ and $h(x) = x^2 + 5$, determine:

a) h(g(x)) b) g(h(-2)) c) $f^{-1}(x)$

d) $g^{-1}(x)$ by switching _____ and then solving for _____. (Fill in the blanks and find the inverse.)

6. Expand and simplify: $\sum_{n=2}^{5}(3n-6)$

7. Using EITHER the slope/intercept (y = mx + b) or the point slope $y - y_1 = m(x - x_1)$) form of a line, write an equation for the lines described: SHOW ALL WORK

a) with slope -2, containing the point (3, 4)

b) containing the points (1, -3) and (-5, 2)

c) with slope 0, containing the point (4, 2)

d) parallel to 2x – 3y = 7 and passes through (5,1)

e) perpendicular to the line in problem #7 a, containing the point (3, 4)

8. Without a calculator, determine the exact value of each expression:

a) $\sin\frac{\pi}{2}$ b) $\sin\frac{3\pi}{4}$ c) $\cos\pi$ d) $\cos\frac{7\pi}{6}$

e) $\cos\frac{\pi}{3}$ f) $\tan\frac{7\pi}{4}$ g) $\tan\frac{2\pi}{3}$ h) $\tan\frac{\pi}{2}$

9. For each function, make a neat **sketch**, putting numbers on each axis. Determine the **Domain** and **Range** for each function. Also, for parts d, e, f and g , write the equations of the asymptotes

a) y = sin x b) $y = x^3 - 2x^2 - 3x$ c) $y = x^2 - 6x + 1$

d) $y = \frac{x+4}{x-1}$ e) y = ln x f) $y = e^x$

g) $y = \frac{1}{x}$ h) $y = \frac{x^2 - 4}{x+2}$ i) $y = \sqrt[3]{x}$

j) $y = |x+3| - 2$ k) $y = \sqrt{x-4}$ l) $y = \sqrt{x^2+4}$

10. Make a neat sketch of the piecewise function:

$$y = \begin{cases} x^2 & \text{if } x < 0 \\ x + 2 & \text{if } 0 \le x < 3 \\ 4 & \text{if } x \ge 3 \end{cases}$$

11. Solve for x, where x is a real number. Show the work that leads to your solution:

a) $2x^2 + 5x = 3$

b) $(x-5)^2 = 9$

c) $(x+3)(x-3) > 0$

d) $\log x + \log(x-3) = 1$

e) $|x-3| < 7$

f) $\ln x = 2t - 3$

g) $12x^2 = 3x$

h) $27^{2x} = 9^{x-3}$

i) $e^{3x} = 5$

12. If $f(x) = x^2 - 2x$, determine

a) $f(x+h)$

b) $f(x+h) - f(x)$

c) $\dfrac{f(x+h)-f(x)}{h}$