

Math 1000 Pre-Cal Practice

1. (Working with functions)

(a) Given that $f(x) = (x + 3)^2 + x$, find $f(a + h)$ and simplify.

(b) Given that $g(x) = \sin(x)$ and $f(x) = 2x + 1$, find $g(f(x))$ and $f(g(x))$.

(c) Given that $f(x) = \frac{\sqrt{x}}{x^2+1}$, find $f(2)$, $f(4)$, and $f(u^2)$.

(d) Given that $f(x) = x^3$, evaluate

$$\frac{f(2+h) - f(2)}{h}$$

2. (Equations of lines)

(a) Find the equation of the line if the slope is 3 and it goes through the point (1, 1).

(b) Find the equation of the line if the slope is -1 and it goes through the point (0, 1).

(c) Find the equation of the line if the slope is $\frac{-1}{2}$ and it goes through the point (2, -2).

3. (Laws of logarithms) Use Laws of Logs to simplify the following:

(a)

$$\ln(x^2)$$

(b)

$$\frac{\ln(8)}{2}$$

(c)

$$\ln \frac{(x+1)^3(3x^2+5)^4}{x^5}$$

(d)

$$\ln(8) \ln(2^{1/3})$$

4. (Working with exponents) Simplify the following:

(a)

$$x^{-5}x^{-4}$$

(b)

$$(x^2)^3 + x^6$$

(c)

$$(x^2)^3 + x^4$$

(d)

$$\frac{x^6}{x^4}$$

(e)

$$\frac{x^{1/2}}{x^2}$$

(f)

$$8^{2/3}$$

5. (Trigonometry)

(a) What is $\cos(\frac{\pi}{2})$?

(b) What is the $\cos(\sin(0))$?

(c) Simplify $\frac{\tan(2\theta)}{\sin(2\theta)}$.

(d) Simplify $\frac{\cot(3\theta)}{\sin(2\theta)}$.