MATH 149 – FALL 2021

Review for Review Test

Here are some things you ought to be able to do.

1. Find the equation of a line given some information.
2. Solve an equation using the quadratic formula.
3. Solve an equation using factoring.
4. Solve inequalities (either using factoring or the function approach).
5. Use the basic trigonometric identities to determine the length of sides in a triangle.
6. Find the natural domain for a function.
7. Sketch one of the basic functions listed on pages 6 and 7 which has been transformed in some way (shifted, stretched, reflected, etc).
8. Compute the formula of a function defined by composing two simpler functions.
9. Compute an expression involving logarithms.

Several of the topics may be covered in a single question. For instance, in order to determine the natural domain of a function, you may have to solve an equality or inequality. What follows are some practice problems. You do NOT have to submit them.

1. Find the equation of the line through the point $(1, 3)$ and perpendicular to the line $3x + 2y = 1$.

2. Solve the following equations.
   a) $2x + 3 = 2(x + 1) + 2$
   b) $x^3 = x^2 + 6x$

3. Solve the following inequalities
   a) $x^2 - x - 1 > 0$
   b) $\frac{x}{x^2-x-6} \geq 0$

4. Find the domain of the following functions.
   a) $f(x) = \frac{1}{x^2-2x}$
   b) $g(x) = \sqrt{x^2 - 2x}$
   c) $h(x) = \frac{x}{x^3-x}$
   d) $F(x) = \sqrt{x^3 - x}$
   e) $G(x) = \ln(x^3 - x)$

5. Compute the following.
   a) $\log_2 2^{1000}$
   b) $\log_2 7$ (Either give me a decimal value, or express your result as a fraction of other logarithms.)

6. Sketch the following functions.
   a) $f(x) = e^{-x}$
   b) $g(x) = (x - 2)^2 - 2$
   c) $h(x) = -\sin(\pi x) + 2$
   d) $y = 2 - x^2$
   e) $y = -\sqrt{-x}$

7. If $f(x) = e^x + \sin x$ and $g(x) = x^2 + 1$, compute $f \circ g(x)$ and $g \circ f(x)$.