Math 1316: 3-29 Worksheet

March 29, 2022

1. Consider the equation
$$2\sin(t) = \sqrt{3}.$$

   Let's walk through solving this step by step.

   (a) Solve the equation for $\sin(t)$, getting something of the form $\sin(t) = A$.

   (b) Find one solution for t for the equation from (a). [Hint: you might find it useful to reference your table from last class's worksheet, to know how to calclate $\sin^{-1}(A)$.]

   (c) Having found one solution, find another solution in a different quadrant. This shold give you two solutions between 0 and 2π.

   (d) Having found the two solutions between 0 and 2π, find the two solutions between 2π and 4π. Then find the solutions between 4π and 6π. If you want even more, find the solutions between 6π and 8π.

   (e) Don't forget about negative solutions! Find the two solutions between -2π and 0. For even more, find the solutions between -4π and -2π.

   (f) In general, what do the solutions look like? How do you produce them from the two solutions between 0 and 2π.

2. Consider the equation
$$2\cos(3t) = -1.$$

   Find all solutions in the range $-\pi/2 \le t \le \pi/2$.

3. Consider the equation
$$3\tan(2t) = 4.$$

   Using a calculator, find decimal approximations for two different solutions to this equation. (Your choice of which two among the infinitely many options.)

4. Consider the equation
$$\sin(t) = 2\cos(t).$$

   Using a calculator, find decimal approximations for a quadrant 1 soltion to this equation.