Math 17A
Vogler
Discussion Sheet 1

1.) Solve for x.

    a.) $|2x - 1| = 3$ b.) $|x - 2| \leq 5$

    c.) $|3x - 4| > 11$ d.) $|x - 3| = |2x + 2|$

2.) Determine the center and radius of the following circle : $2x^2 + 2y^2 = 4x - 12y + 12$

3.) Consider the line L given by $2x + 4y = 5$. Find an equation of the line passing through the point $(-1, 2)$ and which is

    a.) parallel to L.
    b.) orthogonal (perpendicular) to L.

4.) Solve the following equations for θ, $0 \leq \theta \leq 2\pi$.

    a.) $\sin^2 \theta = 3/4$
    b.) $2 \sin \theta \cos \theta - \cos \theta = 0$

5.) Assume that your GPA is inversely proportional to the square root of your average daily time (hours) spent on Facebook during Fall Quarter. If your GPA is 3.2 when you spend 1 hour per day, what is your GPA when you spend 4 hours per day on Facebook ?

6.) Solve for x.

    a.) $2^{x-3} = 1/16$ b.) $10^{x+1} = 3$
    c.) $\log_3 x = -2$ d.) $\log_x 64 = 3$

7.) Write each complex expression in the form $a + bi$.

    a.) $i(3 - i)$ b.) i^{39} c.) $\dfrac{2i + 8}{i - 1}$ d.) $\sqrt{2i}$ (challenging)

8.) Determine the domain and range of each function.

    a.) $f(x) = 9 - x^2$ b.) $g(x) = \sqrt{9 - x^2}$ c.) $y = 3 + \dfrac{1}{(x - 1)^2}$

9.) Consider the function $f(x) = \dfrac{x + 1}{2 - x}$.

    a.) Show that f is one-to-one
        i.) by graphing the function and concluding that it passes the horizontal line test.
        ii.) by using the algebraic definition of one-to one.
    b.) Find $f^{-1}(x)$, the inverse of f.

10.) Consider the functions $f(x) = \dfrac{1}{x - 3}$ and $g(x) = \dfrac{x}{2x + 5}$.

a.) Determine $(f \circ g)(x) = f(g(x))$. b.) Determine $(g \circ f)(x) = g(f(x))$.

11.) Show algebraically that $f(x) = 3 + x^2 + x^4$ is an even function.

12.) Show algebraically that $g(x) = x - \sin x$ is an odd function.

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The following problem is for recreational purposes only.

13.) Divide the following trapezoid into four (4) identical (size and shape) pieces.

Thanks to Dr. Kouba