Quiz 2: §1.4, 1.5 & 1.6
June 17, 2016

Instructions: Please show all of your work as partial credit will be given where appropriate, *and* there may be no credit given for problems where there is no work shown. All answers should be boxed and completely simplified, unless otherwise stated. No electronics are allowed.

1. [**8 points each**] Evaluate each of these limits.

   (a) $\displaystyle \lim_{t \to 0} \frac{1 - \cos^2 t}{t \sin t}$

   (b) $\displaystyle \lim_{\theta \to 0} \frac{\cot(5\theta)}{\sin(2\theta)}$

   (c) $\displaystyle \lim_{\theta \to 0} \frac{\tan(5\theta)}{\sin(2\theta)}$

(d) $\lim\limits_{x \to 2} \dfrac{3x^2 - 5x}{(x-2)(3-x)}$

2. [**8 points**] State whether this function is continuous or not. If the function is discontinuous, give the x-value(s) where the discontinuities occur and also state what type of discontinuities occur at each of those x-values. Then "patch" the hole(s), if possible.

(a) $f(x) = \dfrac{(x+5)(x-2)}{x^2 - 25}$ Continuous everywhere?   Yes   or   No   (circle one)

   If no, it's discontinuous at $x =$_____

(b) For each of the x-values you listed above, why is it discontinuous? (You may not need all of the lines provided). Show work to support your answer.

   At $x =$_____, there is a   hole   or   jump discontinuity   or   vertical asymptote

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(c) If $f(x)$ has any discontinuities, how can we re-define $f(x)$ so that its holes are "patched"? (*Recall that we cannot patch vertical asymptotes or jumps. For this problem, just patch any holes that exist.*)