Math 215-800 **PS #2**
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Writing Exercises. Type up your solutions to #1 using LaTeX. Start by going to the course webpage and downloading the .tex file for this assignment; pop that .tex file into your favorite latex editor (probably Overleaf.com) and type your responses just after the corresponding problem in the .tex file.

1. For each conditional provided: (1) Write the contrapositive, (2) write the converse, and (3) write the negation.

   (a) If f is continuous on $[a, b]$ then f is integrable on $[a, b]$.
   Contrapositive: If f is not integrable on $[a, b]$, then f is not continuous on $[a, b]$.
   Converse: If f is integrable on $[a, b]$, then f is continuous on $[a, b]$.
   Negation: f is continuous on $[a, b]$ but f is not integrable on $[a, b]$.

   (b) If $a = 0$ or $b = 0$ then $ab = 0$.
   Contrapositive: If $ab \neq 0$, then $a \neq 0$ and $b \neq 0$.
   Converse: If $ab = 0$, then $a = 0$ or $b = 0$.
   Negation: $a = 0$ or $b = 0$ but $ab \neq 0$.

   (c) If x is an integer and y is an integer then $x + y$ and xy are integeres.
   Contrapositive: If $x + y$ is not an integer or xy is not an integer, then x is not an integer or y is not an integer.
   Converse: If $x + y$ and xy are integers, then x is an integer and y is an integer.
   Negation: x and y are integers, but $x + y$ is not an integer or xy is not an integer.

   (d) The polynomial f has two complex roots, if the degree of f equals two.
   Contrapositive: The degree of the polynomial f does not equal two if f does not have two complex roots.
   Converse: The degree of the polynomial f equals two if f has two complex roots.
   Negation: The degree of the polynomial f equals two, but f does not have two complex roots.

Additional Exercises. Complete the next problem, #2. You need not typeset your answers, unless you want to. Staple your answers to your write-up for the Writing Exercise and turn in one homework with your name on the front, at the top.

2. Negate each of the following statements. You may "translate" into Ps and Qs (or quantifiers and predicates, as appropriate) first, to help with the negation, but write your final answer in complete sentences.

   (a) All real numbers are integers.

   (b) There are positive integers less than or equal to $\sqrt{\pi}$.

   (c) Every integer is divisible by 1 and divisible by 7.

   (d) Some even integers are divisible by 4.

   (e) For any real number x, if x is less than 0 then $\sqrt{x}$ is not a real number.