

Exercises: transformations of functions, and logic

Mr. Neeman. 10A, December 1, 2011

#1. For each of the following transformations of $f(x)$, describe in words the relationship between the graphs of the transformed function and the original one, and illustrate this with a small sketch (you can make up the function $f(x)$ to use for the sketch).

- (a) $f(x) - 3$
- (b) $f(-x) + 1$
- (c) $f(x + 3) - 3$
- (d) $f(\frac{x}{2}) + 3$
- (e) $-2f(x - 1)$
- (f) $-f(-x) + 1$

#2. Draw a truth table for each of the following propositions and use it to say whether they're tautologies, contradictions, or contingent. Note: except for (a), these are from the homework we had on truth tables, so you can see their solutions (for the truth tables at least) on the course page where it says "Solutions for the first homework on truth tables".

- (a) $(p \Rightarrow q) \Leftrightarrow (p \wedge \neg q)$
- (b) $\neg q \Leftrightarrow (p \vee q)$
- (c) $p \Rightarrow (\neg q \Rightarrow p)$
- (d) $p \underline{\vee} (\neg p \Leftrightarrow q)$
- (e) $\neg q \vee (q \Rightarrow \neg p)$