(a) State the triangle inequality for two numbers a and b.

(b) Find an example of two numbers a and b so that $|a+b| = |a| + |b|$, and a different pair of numbers c and d so that $|c+d| \neq |c| + |d|$.

(c) Among the conditions $a > 0$, $a < 0$, $b > 0$, $b < 0$, find two of them that will guarantee that $|a+b| \neq |a| + |b|$. Also find a second pair of these conditions with the same result.

(d) A student was faced with the problem "Solve $|x-5| < 8$." The student wrote

$$|x-5| = |x+(-5)| = |x| + |-5| = |x| + 5$$

and then solved $|x| + 5 < 8$, which gave $|x| < 3$, leading to $-3 < x < 3$. How would you explain to this student that this is incorrect? How would you correct this?