1) $E(x)$: x exercises regularly
$M(x)$: x has good muscle strength
$L(x)$: x has low blood pressure

$\forall x\,(E(x) \to M(x))$
$\forall x\,(E(x) \to L(x))$
$E(\text{Juanita})$ $\qquad$ $L(\text{Juanita})$

$\therefore \exists x\,(M(x) \land L(x))$

1	$\forall x\,(E(x) \to M(x))$	hypothesis
2	$\forall x\,(E(x) \to L(x))$	hypothesis
3	Juanita exercises regularly	hypothesis
4	$E(c) \to M(c)$	universal instantiation (1,3)
5	$E(c) \to L(c)$	universal instantiation (2,3)
6	$M(c)$	modus Ponens (3,4)
7	$L(c)$	modus Ponens (3,5)
8	$M(c) \land L(c)$	conjunction (6,7)
9	$\exists x\,(M(x) \land L(x))$	Existential generalization (3,8)

$\boxed{\text{True}}$

If we replace (C) with "Juanita has low blood pressure"

the statement is invalid because we can't use modus ponens

2) The proof used the assumption $\forall y((y \le x)$ which assume there is a largest number. However, there is no largest number. Therefore, the proof is invalid.

3) By the definition of fast squaring trick for 2-digit numbers ends in 5 is its first digit $x \cdot (x+1)$ and write 25 at the end.

Asume that x is an integer that is between one to nine inclusive.

The two digit number that ends in 5 are
15, 25, 35, ..., 95
we can write it in algebra form as
$x \cdot 10 + 5$
then we square it
we got $(10x+5)^2$

By the square trick definition
the square of the two digit number that ends in 5 is
$(x)(x+1) \cdot 100 + 25$
then we got $100x(x+1)+25$

to find out if they are equal

$(10x+5)^2$ $\qquad$ $100x(x+1)+25$

$= 100x^2+100x+25$ $\qquad$ $= 100x^2+100x+25$

Therefore, they are equal and the fast square trick is true.

4) let x, y, z be real numbers
then $|x-y| \leq |x-z| + |y-z|$

Case 1: $y \leq x$

$|x-y| = x-y$
$|x-z| = x-z$
$|y-z| = z-y$

$x-y \leq x-z+z-y$
$x-y \leq x-y$

It is always true.

Case 2: $y > x$

$|x-y| = y-x$
$|x-z| = x-z$
$|y-z| = y-z$

$y-x \leq x-z+y-z$
$y-x-x+z-y+z \leq 0$
$-2x+2z \leq 0$

Since $y > x$, it is always true.

In both cases, $|x-y| \leq |x-z| + |y-z|$ is true, therefore the claim is true.

5) Song(x) = x is a song
Remove(x, y) = remove word y from song x
Add(x, y) = add word y to song x

$\forall x\,(\text{Remove}(x, w) \rightarrow \neg \text{Song}(x)) \Rightarrow \forall x\,(\text{Add}(x, w) \rightarrow \neg \text{Song}(x))$

I would say removing a word is modifying a song and if removing a word make it not a song then adding a word is also modifying a song which also makes it not a song.