18. [9 pts - 3 each] Identify each statement as true or false, carefully justifying your claim with the correct type of argument.

(a) \[30 \div 6\] \[\text{False. There is no whole number for which} 30 \cdot \square = 6.\]

(b) The LCM of two numbers is always larger than either of them.
\[\text{False. LCM}(30, 6) = 30 \text{ on the most.}\]

(c) There is a number that has 15 as a factor, but not 5.
\[\text{False 15 has 5 as a factor already, so any number that equals 15 times something also equals } 5 \cdot 3 \cdot 5' \text{th.}\]

19. [6 pts] Warren raked yards and cleaned gutters all last month for $30 a household. He spent all his well-earned rewards on some cool computer games he really wanted, at $35 apiece. What’s the smallest number of CDs he could have bought? Show work and briefly explain.

He earned a multiple of $30 and spent a multiple of $35, so we need the LCM first of 30 and 35:
\[30 = 2 \cdot 3 (5) \quad \text{LCM} = 5 \cdot 2 \cdot 3 \cdot 7 = 210.\]
\[\text{Now } 210 \div 35 = 6 \text{ CDs purchased.}\]

20. (a) [3 pts] Write the exact number sentence modelled by this “mailtime” story: The mail carrier brings a bill for $46 and 2 checks for $19 each. He also takes away a misdelivered bill for $57 and a check for $19. What’s your net worth?
\[-46 + 2(19) - (-57) = 19 = \frac{380}{30}.\]

(b) [2 pts] Suppose in the above scenario that the mail carrier also takes away an illegible item. If your net worth is now $125, what type of item did he remove, and for how much?
\[\text{It was a bill for } \frac{95}{75} \text{.}\]

21. [6 pts - 3 each] Refer to the numbers \(a, b, c,\) and \(d\) plotted on the number line below, not necessarily to scale!

Fill in each blank with the correct choice of \(<\) or \(>\), then clearly explain your reasoning in a short sentence.

(a) \((b - a)c \_> 0\)
\[b - a \text{ is positive because a larger number minus a smaller one is always positive.}\]
\[c \text{ is also positive, so the product is positive.}\]

(b) \(|a - d| \_> bc\)
\[bc \text{ is negative because } b \text{ is negative while } c \text{ is positive.}\]
\[|a - d| \text{ is positive (or at worst 0).}\]