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CS 210
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Assignment #2

1) <pattern> ::= <name> | _ | <constant> | <tuple> | <list> | <cons>
<more patterns> ::= , <pattern> <more patterns> | <empty>
<tuple> ::= (<pattern>, <pattern> <more patterns>)
<list> ::= [] | [<list element> <more list elements>]
<cons> ::= <list element> :: <list>
<more list elements> ::= , <list element> <more list elements> | <empty>

2)b)

Step	Action
1	$x = 3k$; k is an integer
2	$y = 24m$; m is an integer
3	$y = 24m$ $= 3(8m)$ $x = 3k$; k is an integer because $(8m)$ is an integer $\therefore x := y$ is safe

c) Counter example: 7 is a prime integer greater than 3 and is not divisible by 3
$\therefore Z := X$ is unsafe

Back Side

e)

Step	Action
1	$y = 24k$; k is an integer
2	z is a prime integer > 3
3	This must mean z is odd
4	$z^2 - 1 = (z-1)(z+1)$
5	$(z-1) \vdots (z+1)$ are both even integers $\vdots$ because they are both consecutive even integers, either $(z-1)$ is a multiple of 4 $\vdots$ $(z+1)$ is a multiple of 2 or $(z-1)$ is a multiple of 2 $\vdots$ $(z+1)$ is a multiple of 4
6	$(z-1)$ or $(z+1)$ must also be a multiple of 3 because $(z-1)$, z, $\vdots$ $(z+1)$ are 3 consecutive integers; z can't be divisible by 3 because it is prime
7	$y = 2 \cdot 2 \cdot 2 \cdot 3 \cdot k = 24k$ $\therefore Y := (z * z) - 1$ is safe

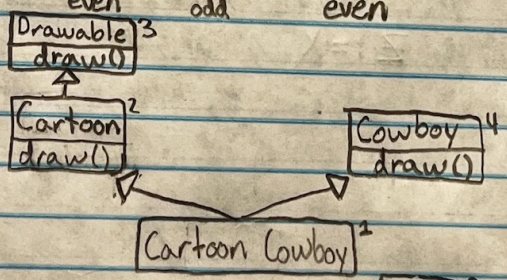
Work: x is prime integer > 3

$x^2 - 1 = (x-1)(x+1)$

$(x-1) \times (x+1)$

even, odd, even

3) a)



b)