CSI 35 Test 1 Review Questions Answers

1. $-\frac{3}{5}$ 2. 1,989

3. $\sum_{i=-2}^{26}(5i-8)=5\sum_{i=-2}^{26} i-\sum_{i=-2}^{26} 8=\frac{5\cdot(-2+26)(26+3)}{2}-8(26+3)=1{,}508$

4. $\sum_{j=-3}^{n+1}(j+5)^3=\sum_{j=1}^{n+5}(j+1)^3$

5. It is an arithmetic sequence, d = 4, a_0 = 15, and a_n = 403, find n, then find that the summation is equal to 20,482

6. It is a geometric sequence, r = -4, a_0 = 3 and a_6 = 12,228, therefore we will get the summation
$\sum_{i=0}^{6} a_0 r^i=\sum_{i=0}^{6} 3\cdot(-4)^i=\ldots=9{,}831$

7. see the proof in a separate file

8. see the proof in a separate file

9. see the proof in a separate file

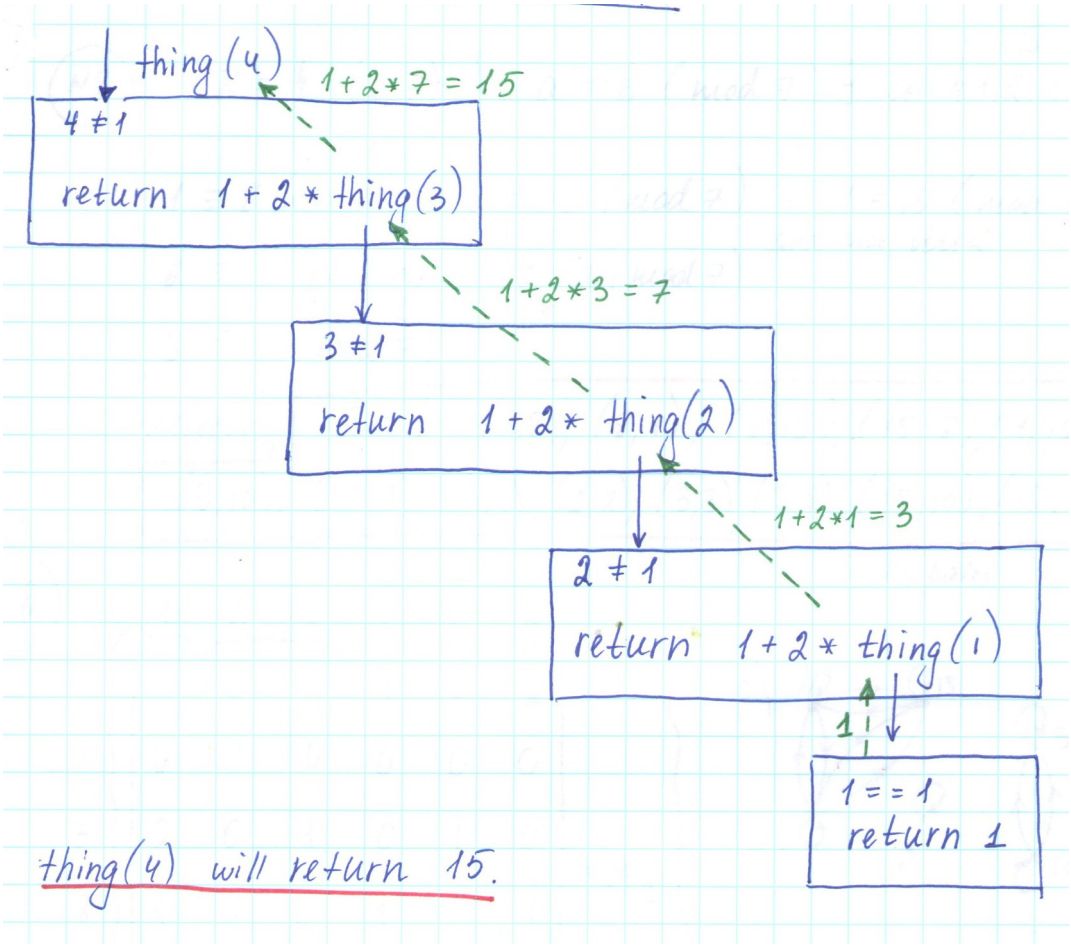
10. the proof is not correct. The mistake is in the basis step: when n = 1 we get $\frac{1}{0\cdot 1}$ on the left side of the equation, which is undefined; and on the right side we get $\frac{3}{2}-\frac{1}{1}=\frac{1}{2}$ $undefined\neq\frac{1}{2}$, hence the base step fails.

11. 1) the given definition is valid because *f(n)=2f(n-3)* is defined for all n ≥ 4.
2) $f(n)=\begin{cases} 0 & ,if\ n \bmod 3 = 2 \\ 2^{n \operatorname{div} 3} & ,otherwise \end{cases}$
or
$f(n)=\begin{cases} 0 & ,if\ 3 \mid (n+1) \\ 2^{n \operatorname{div} 3} & ,otherwise \end{cases}$

12. $P_m(0) = 0$
$P_m(n) = m + P_m(n - 1)$, for $n > 0$

13. Basis: $1 \in S$
Recursive rules: if $x \in S$, then
(1) $x1 \in S$
(2) $x0 \in S$

14.


thing(4)
1+2*7 = 15
4 ≠ 1
return 1 + 2 * thing(3)
1+2*3 = 7
3 ≠ 1
return 1 + 2 * thing(2)
1+2*1 = 3
2 ≠ 1
return 1 + 2 * thing(1)
1
1 == 1
return 1
thing(4) will return 15.