

(CSC165H1) ”Problem Set 0”

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My courses

- CSC165H1, Mathematical Expression and Reasoning for Computer Science, Lindsey Shorser
- COG250Y1, Introduction to Cognitive Science, John Vervaeke
- CSC207H1, Software Tools and Systems Programming, Karen Reid
- NEW334H1, Science of Wisdom: Buddhist and Western Traditions, Michel Ferrari

Set notation

$$S_1 \setminus S_2 = \{165, 207, 209, 258, 263, 369, 373\}$$

A truth table

p	q	r	$\neg(p \wedge q \wedge r) \iff (p \Rightarrow q)$
T	T	T	F
T	T	F	T
T	F	T	F
T	F	F	F
F	T	T	T
F	T	F	T
F	F	T	T
F	F	F	T

A calculation

a) Simplifying using the given formula gives ($d = 4$ and $k = -315$):

$$\begin{aligned}\sum_{i=0}^{n-1}(di + k) &= \sum_{i=0}^{n-1}(4i - 315) \\ &= 4\left(\frac{n(n-1)}{2}\right) - 315n \\ &= 2n^2 - 317n\end{aligned}$$

b) Applying quadratic formula after solving inequality gives two answers:

$$\begin{aligned}\sum_{i=0}^{n-1}(4i - 315) &> 2020 \\ 2n^2 - 317n &> 2020 \\ 2n^2 - 317n - 2020 &> 0 \\ n &= \frac{317 \pm \sqrt{116649}}{4} \\ n &= -6.13, 164.63\end{aligned}$$

The zeros are roughly -6.13 and 164.63 . However, since n is the positive integer, n should be 165 . Therefore, the smallest positive integer, n , that makes $\sum_{i=0}^{n-1}(4i - 315)$ greater than 2020 , is 165 .