

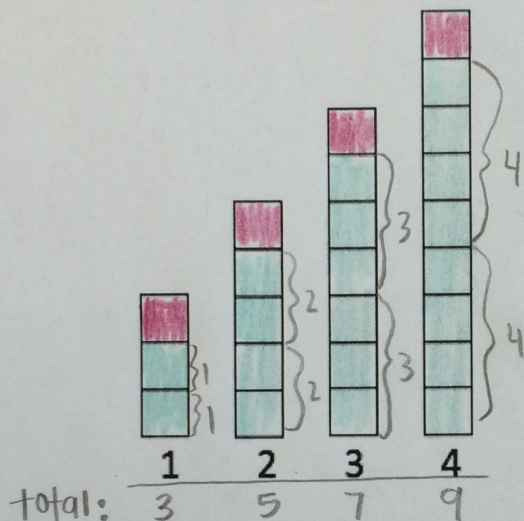
1.3 Scott's Macho March

A Solidify Understanding Task

After looking in the mirror and feeling flabby, Scott decided that he really needs to get in shape. He joined a gym and added push-ups to his daily exercise routine. He started keeping track of the number of push-ups he completed each day in the bar graph below, with day one showing he completed three push-ups. After four days, Scott was certain he can continue this pattern of increasing the number of push-ups for at least a few months.



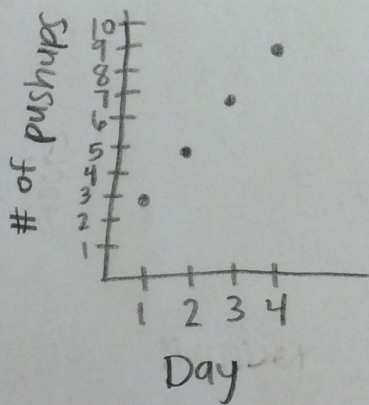
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1. Model the number of push-ups Scott will complete on any given day. Include both explicit and recursive equations.

day	# of pushups
1	3
2	5
3	7
4	9

linear



Discrete graph
(don't have day 1.5 etc.)

Yes, it is a function

explicit: $f(d) = 2(d) + 1$
 recursive: $f(d) = f(d-1) + 2$

Domain: $\{1, 2, 3, 4, 5, \dots\}$
 possible x-values
 Range: $\{3, 5, 7, 9, 11, \dots\}$
 outputs (y-values)

Scott's gym is sponsoring a "Macho March" promotion. The goal of "Macho March" is to raise money for charity by doing push-ups. Scott has decided to participate and has sponsors that will donate money to the charity if he can do a total of at least 500 push-ups, and they will donate an additional \$10 for every 100 push-ups he can do beyond that.

2. Estimate the total number of push-ups that Scott will do in a month if he continues to increase the number of push-ups he does each day in the pattern shown above.

March has 31 days

$$f(31) = 2(31) + 2 = 62 + 2 = 64 \text{ pushups that day}$$

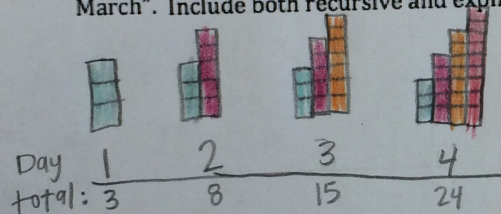
I estimate about 960 push-ups in the month of March.

3. How many push-ups will Scott have done after a week?

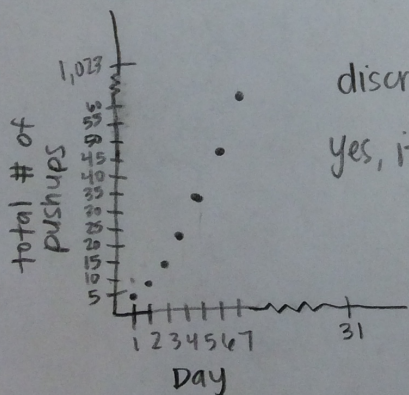
$$3 + 5 + 7 + 9 + 11 + 13 + 15 = 63$$

Day: 1 2 3 4 5 6 7

4. Model the total number of push-ups that Scott has completed on any given day during "Macho March". Include both recursive and explicit equations.



$$3 + 5 + 7 + 9 + 11 + 13 + 15 + \dots + 61 + 63 = 1,023$$

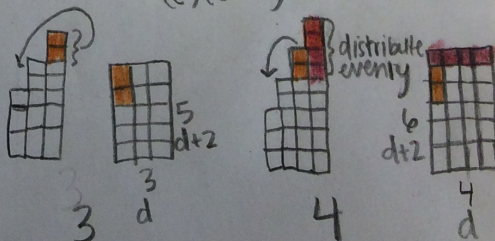


day	# of pushups that day	total # of pushups
1	3	3
2	5	8
3	7	15
4	9	24
5	11	35
6	13	48
7	15	63
...
30	61	960
31	63	1,023

$$(t)(t+2)$$

$$f(d) = (d)(d+2) \rightarrow t^2 + 2t \text{ explicit} \rightarrow$$

$$f(d) = f(d-1) + 2d + 1 \text{ recursive}$$



5. Will Scott meet his goal and earn the donation for the charity? Will he get a bonus? If so, how much? Explain.

Yes, he will have done 1,023 pushups total in the month of March (31 days).

$$1,023 - 500 = 523$$

extra pushups

$$523 \cdot 10 = \$5,230 \text{ bonus}$$

He will receive \$5,230 for charity.

#4 |

Domain: $\{1, 2, 3, 4, \dots, 31\}$
↑ # of days in March

Range: $\{3, 8, 15, 24, \dots, 1,023\}$
↑ total # of push-ups done in March