Y11 Harder Tables and Patterns Practice #2

1. Complete the gaps in the patterns given and write the rules:

a)

x	1	2	3	4	5	...	20	rule
y	20	17	14	11				

b)

x	...	10	11	12	13	14	15	rule
k		65	75	85	95			

c)

n	1	2	3	4	5	...	20	rule
t_n	3	9	19	33				

d)

n	1	2	3	4	5	...	20	rule
t_n	6	14	24	36	50			

2. How many dots would the 100th in each pattern have?

Write the equation for the number of lines in terms of the position in the pattern.

a) t_{100} =

tn =

b) t_{100} =

tn =

c) t_{100} =

tn =

d) t_{100} =

tn =

Answers: Y11 Harder Tables and Patterns Practice #2

1. Complete the gaps in the patterns given and write the rules:

a)

x	1	2	3	4	5	...	20	rule
y	23	20 (−3)	17	14	11	**8**		**$^{-}37$**	**$y = {}^{-}3x + 23$**

b)

x		10	11	12	13	14	15	rule
k	10 × 10	65 (+10)	75	85	95	**105**	**115**	**$k = 10x - 35$**

c)

n	1	2 (+6)	3 (+10)	4 (+14)	5	...	20	rule
t_n	3	9 (+4)	19 (+4)	33	**24**		**801**	**$t_n = 2n^2 + 1$**

d)

n	1	2 (+8)	3 (+10)	4 (+12)	5	...	20	rule
t_n	6	14 (+2)	24 (+2)	36	50		**500**	**$t_n = n^2 + 5n$**

2. How many dots would the 100th in each pattern have?

Write the equation for the number of lines in terms of the position in the pattern.

a) even spacing of 6, with 1 more than 6 at the start — $t_{100} = 601$, **$t_n = 6n + 1$**

b) increasing spacing by 2 ⇒ n^2 base, leaving 2, 3, 4, 5 etc — $t_{100} = 10101$, **$t_n = n^2 + n + 1$**

c) even spacing of 3, with 1 more than 3 at the start — $t_{100} = 601$, **$t_n = 3n + 1$**

d) doubling each time, so exponential — $t_{100} = 1.27 \times 10^{30}$, **$t_n = 2^n$**