Linear Patterns #2

Write the equations for these patterns:

1

x	y
1	8
2	14
3	20
4	26
5	32

2

n	p
1	7
2	17
3	27
4	37
5	47

3

x	y
1	15
2	10
3	5
4	0
5	−5

4

x	y
1	13
2	11.5
3	10
4	8.5
5	7

5

a	b
1	3
2	10
3	17
4	24
5	31

6

x	y
1	0
2	−6
3	−12
4	−18
5	−24

7

x	y
0	7
1	16
2	25
3	34
4	43

8

a	b
19	36
20	38
21	40
22	42
23	44

9

x	y
19	−62
20	−66
21	−70
22	−74
23	−78

10.   What is the 50th term in the pattern: 3, 9, 15, 21, 27 … ?

11.   Which term is the first in the pattern 455, 435, 415, 395 … to be less than 100?

12.   If a pattern starts at 0, and the 10th term is 90, what value will the 20th term be?

Linear Patterns #2 – Answers

1       $y = 6x + 2$

2       $p = 10n - 3$

3       $y = -5x + 20$

4       $y = -1.5x + 14.5$

5       $b = 7a - 4$

6       $y = -6x + 6$

7       $y = 9x + 7$ (Note, this pattern starts at $x = 0$, not $x = 1$ like usual)

8       $b = 2a - 2$

9       $y = -4x + 14$

10   Formula is $3x - 3$, so $3 \times 50 - 3 = 147$

11   455, 435, 415, 395 … is $t_n = -20n + 475$

            $-20n + 475 < 100$

            $375 < 20n$

            $375 \div 20 < n$

      The 19th term is the first one less than 100.

12   The 1st term = 0 and the 10th is 90, so an increase of 90 in 9 terms.

      So the equation is going up in $90 \div 9 = 10$ for each term

      The 20th term will be 10 more lots of 10 from the 10th, so will be 190

      (The equation is $y = 10x - 10$, although you don't have to find that.)