Harder Patterns #1 (Quadratics)

Write the equations for these patterns:

1

x	y
1	-1
2	2
3	7
4	14
5	23

2

n	p
1	3
2	7
3	12
4	18
5	25

3

x	y
1	6
2	18
3	36
4	60
5	90

4

x	y
1	11
2	26
3	51
4	86
5	131

5

a	b
1	1
2	3
3	6
4	10
5	15

6

x	y
1	5
2	12
3	21
4	32
5	45

7

a	b
1	66
2	54
3	34
4	6
5	-30

8

a	b
1	0
2	-2
3	-6
4	-12
5	-20

9

x	y
1	6
2	15
3	30
4	51
5	78

10. For the pattern: 12, 34, 66, 108, 160 …

 What is the 20th term in the pattern?

11. Show when the pattern 20, 36, 48, 56, 60 … becomes negative.

12. Give the 40th term in the pattern: 3, 11, 24, 42, 65 …

Harder Patterns #1 – Answers

1      $y = x^2 - 2$

2      $p = 0.5n^2 + 2.5n$

3      $y = 3x^2 + 3x$

4      $y = 5x^2 + 6$

5      $b = 0.5a^2 + 0.5a$

6      $y = x^2 + 4x$

7      $b = -4a^2 + 70$

8      $b = -a^2 + a$

9      $y = 3x^2 + 3$

10   Formula is $5x^2 + 7x$, so $5 \times 20^2 + 7 \times 20 = $ 2 140

11   20, 36, 48, 56, 60 is $t_n = 22n - 2n^2$ $0 = 22n - 2n^2$ $0 = 2n (11 - n)$ so n = 11 (and 0)

         11th term is zero.   => 12th term will be negative

12   Formula is $2.5x^2 + 0.5x$, so $2.5 \times 40^2 + 0.5 \times 40 = $ 4 020