1. (a) $\boxed{\text{T}}$
   (b) $\boxed{\text{F}}$
   (c) $\boxed{\text{F}}$
   (d) $\boxed{\text{T}}$
   (e) $\boxed{\text{T}}$
   (f) $\boxed{\text{F}}$
   (g) $\boxed{\text{T}}$
   (h) $\boxed{\text{F}}$
   (i) $\boxed{\text{T}}$
2. (a) $\boxed{\text{square, triangular}}$
   (b) $\boxed{\text{triangular}}$
   (c) $\boxed{\text{square}}$
   (d) $\boxed{\text{triangular}}$
3. $\boxed{24}$
4. $\boxed{200}$
5. $\boxed{45}$
6. $\boxed{28,\ 35}$
7. $\boxed{1+2+3+4+5+6,\ 10+11}$
8. n^{th} square number = n^{th} triangular number + $(n-1)^{th}$ triangular number. So 9th square number = 9th triangular number + 8th triangular number: $\boxed{81 = 36 + 45}$
9. We have the pattern $3, 7, 11, \ldots$. We need to find the last number in this pattern less than 600. We notice that each of the numbers in our pattern is 1 less than a multiple of 4. The last multiple of 4 less than or equal to 600 is 600. So the last term in the sequence is $600 - 1 = 599$. So the last person the President shook hands with was 599th in line. Now we need to count how many numbers are in the pattern $3, 7, 11, \ldots, 599$. We use our handy formula: (last - first) $\div$ (the number we are increasing by) + 1. The last number is 599, the first number is 3, and the number we are increasing by is 4. Plug everything in: $(599 - 3) \div 4 + 1 = 596 \div 4 + 1 = 149 + 1 = \boxed{150}$
10. Subtract each corresponding number in the second lottery ticket from the first: $22 - 12 = 10$, $28 - 15 = 13$, and so on. We notice the subtractions make a pattern: 10, 13, 16, 19, 22, 25, 28. This pattern increases by 3.