

# ANSWERS TO CHAPTER 1 REVIEW

① Inductive reasoning uses patterns from looking at specific examples to make a conjecture which may or may not be true. It goes from specific to general. Deductive reasoning uses established facts and properties and applies them to a specific problem. It goes from general to specific.

② (a) Inductive

(b) Deductive

③ (a) 4, 7, 12, 19, 28, 39, ... 52, 67  
 $\begin{matrix} & +3 & +5 & +7 & +9 & +11 & +13 & +15 \\ & \swarrow & \swarrow & \swarrow & \swarrow & \swarrow & \swarrow & \swarrow \end{matrix}$

(b) 1, 8, 27, 64, 125, ... 216, 343  
 \* these are the perfect cubes  
 $1^3, 2^3, 3^3, 4^3, \dots$

④ An arithmetic sequence is a sequence that is generated by adding the same number each time.

EXAMPLE: 5, 8, 11, 14, 17, ... (3 is added each time to get the next #)

A geometric sequence is a sequence that is generated by multiplying by the same number each time.

EXAMPLE: 3, 12, 48, 192, 768, ... (Each # is multiplied by 4 to get the next #)

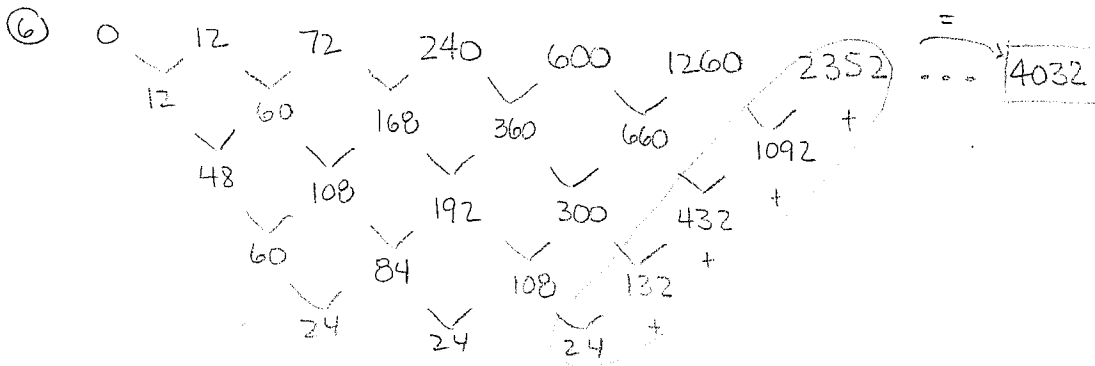
⑤ (a)  $1+2+3+\dots+248+249+250$

$$S = \frac{n(n+1)}{2} = \frac{250(251)}{2} = \boxed{31,375}$$

(b)  $1+3+5+7+\dots+247+249$

$$S = \left(\frac{n+1}{2}\right)^2$$

$$S = \left(\frac{249+1}{2}\right)^2 = \boxed{15,625}$$



⑦ (a)  $T_{10} = \frac{10(10+1)}{2} = \boxed{55}$

(b)  $P_{20} = \frac{20(3(20)-1)}{2} = \frac{20(59)}{2} = 590$

(c)  $O_{18} = \frac{18(6(18)-4)}{2}$   
 $= \frac{18(104)}{2} = \boxed{936}$

⑧  $1 \quad 1$

⑨  $\frac{1}{7} = .142857$

	1	2	1					
1	3	3	1					
1	4	6	4	1				
1	5	10	10	5	1			
1	6	15	20	15	6	1		
1	7	21	35	35	21	7	1	
1	8	28	56	70	56	28	8	1

$\frac{100}{6} = 16\frac{2}{3} = 16\frac{4}{6}$  ← 16 full repeats, & then to the 4<sup>th</sup> digit out of 6 that repeat

The 100<sup>th</sup> digit will be 8.

⑩

112002	211002	201102	200112	200211
121002	210102	201012	200121	
120102	210012	201021		
120012	210021			
120021				

15 different #'s

⑪ Q = quarter, D = dime, N = nickel

2Q	5D	10N
1Q, 2D, 1N	4D, 2N	1 HALF DOLLAR
1Q, 1D, 3N	3D, 4N	11 WAYS
1Q, 5N	2D, 6N	
	1D, 8N	

⑫ This would be a good problem to work backwards on.

- Saturday morning = 35
- Friday night = 70 since half were eaten overnight
- Friday morning = 38 before they collect 32 for the day
- Thursday night = 76
- Thursday morning = 44
- Wednesday night = 88
- Wednesday morning = 56
- Tuesday night = 112
- Tuesday morning = 80
- Monday night = 160
- Monday morning = 128 acorns

⑬  $7^1 = 7$        $7^5 = 16,807$        $7^{491}$

$7^2 = 49$        $7^6 = 117,649$

$7^3 = 343$        $7^7 = 823,543$        $\frac{491}{4} = 122.75$

$7^4 = 2,401$        $7^8 = 5,764,801$        $= 122\frac{3}{4}$

The units digit will be 3.

- ⑭
- a) 48%
  - b) 35 people
  - c) 338 prefer chocolate chip
  - 312 prefer something else
  - so 26 more prefer chocolate chip