PART 1

1. $2(1+2+2^2+2^3+\dots+2^{n-1}) = 510$

$2(1+2+2^2+\dots+2^{n-2}) = 254$

$2+2^2+\dots+2^{n-2} = 126$

$2+\dots+2^{n-3} = 62$

$2+\dots+2^{n-4} = 30$

$2+\dots+2^{n-5} = 14$

$2+\dots+2^{n-6} = 6$

$2+\dots+2^{n-7} = 2$

$\therefore n = 7$

2. $a_1+a_3+a_5+\dots+a_{19} = 15$

$\therefore a_2+a_4+a_6+\dots+a_{20} = -2$

3. $a_3-a_1 = 3$

$a_3 = 3+a_1$

$a_5-a_3 = 3$

$a_5 = 6+a_1$

$a_7 = 9+a_1$

$a_9 = 12+a_1$

$a_{11} = 15+a_1$

13	18	23	33	33	48
15	21	25	36	35	51
17	24	27	39	37	54
19	29	29	42	39	57
21	30	31	45		

$= 20(a_1+a_2) + (37(1+2+3+\dots+19) + 3(1+\dots+19)$

$= 200 + 3\left(\frac{9}{18}\right)(19) + 3\left(\frac{19}{2}\right)\left(\frac{10}{20}\right)$

$= 200 + 570 + 570$

$27(19) = 243$

27

513

4. $\frac{11^{109}}{11\times11\times10} = \frac{11^{109}}{10}$ $\quad 11^{109} \pmod{10} = 1$

$f'(x) = 3$

6. $(f\circ g)'(x) = f'(g(x))\cdot g'(x) = 3x^2+1$

$g'(x) = x^2+\frac{1}{3}$

$g(x) = \frac{x^3}{3}+\frac{x}{3}$ $\quad \frac{x^4}{12}+\frac{x^2}{6}$

7. $1 < -\frac{3}{7}x < 7$

$1\frac{3}{7} < x < 7\frac{3}{7}$

2, 3, 4, 5, 6, 7

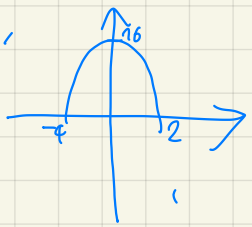
8. ~~75~~ %. $A + 87.5\%.\ B = 120$

$3A + 3.5B = 480$

$A + \frac{3.5}{3}B = 160$

$\frac{3.5}{3}B = 160 - A$

9.



12. $800 \times \frac{140}{100} = 1120$

$\frac{50}{100}x = 1120$

15. $\frac{65+60}{2} = 63.5$

14. $\{\{0\}\} \times \{\ldots\}\ n = 13$

$= 1 \times 13 = 13$

15. $\frac{\binom{8}{1}\binom{7}{1}}{\binom{21}{2}} = \frac{8 \times 7}{\frac{21 \times 20}{2}}$

16. 6, 16, 26, 36, 46, 56, 60, 62, 64, 66, 68, 76, 86, 96

17. $441 + 42 + 3$

$63 \times 7 + 14 \times 3 + 3$

$f(x+y+z) = 24x$

$y + z = 3x$

PART 2

1.

+6, −2 (across the top); +4, +4 (on the right side); +4, +2 (on the left side); −1 (on the right side)

1 A	8 H	6 F
5 E	15 O	10 J
7 G	2	9 I

3. 65 − 65 − 77 − 89 − 101

4. 47, 72 × 2 = $\frac{95,44}{100}$ × 50000

5. 6 ⌒(4) 10 ⌒(8) 18 ⌒(12) 30 ⌒(16) 46 ⌒(20) 66 ⌒(2044) 80

(4 7 720)

6. 4 ⌒(8) 12 ⌒(56) 68 ⌒(562) 630 ⌒

7. 9 $\xrightarrow{\times 2}$ 18 $\xrightarrow{-4}$ 14 $\xrightarrow{\times 2}$ 28 $\xrightarrow{-4}$ 24 $\xrightarrow{\times 2}$ 48 $\xrightarrow{-4}$ 44

9. +4 $^{+1}$ +5 $^{+3}$ + 8 $^{+9}$ + 17 $^{+27}$ + 44

13. $\frac{1}{2}$ (~~12~~ 6)(120+60) = $\frac{~~1060~~}{~~120~~}$

14. $\frac{640}{2^n} = 5$

$2^n = 128$

$n = 7$

15. Lemon Mango มะเฟือง Coco

ชร., สตูล นA. ภูเก็ต

18. ฟ้า ผา เขา

ส L X S y M

ก S y M

ถ M L X S

21. A E G B D F C