

1) $2 + 2^2 + 2^3 + 2^4 + \dots + 2^n = 510$

$2^0 = 512$
 $2^0 = 256$
 $2^{n-1} + 16 + 32 + 64 + 128 + 256 = 510$

2) $S_n = \frac{a_1(1-r^n)}{1-r}$

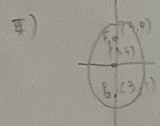
$S_{20} = \frac{a_1(1-r^{20})}{1-r} = 13$ ①

① $\frac{1+r}{1-r} = \frac{13}{17}$
 $17 + 17r = 13 - 13r$
 $30r = -4$
 $r = \frac{-4}{30} = -\frac{2}{15}$

3) $a_3 - a_1 = 3$
 $a_1 + 2d - a_1 = 3$
 $d = \frac{3}{2}$

$a_1 + a_3 = 10$
 $2a_1 + d = 10$
 $2a_1 + \frac{3}{2} = 10$
 $a_1 = \frac{17}{4}$

$S_n = \frac{n}{2}(2a_1 + (n-1)d)$
 $S_{20} = \frac{20}{2}(2(\frac{17}{4}) + 19(\frac{3}{2})) = 20(\frac{17+117}{2}) = 130 \cdot 10 = 1300$



$a = 5$
 $b = 2$
 $c = 4$

Winkelhalbierende $F_1(3, 9)$ $|| r || = (0, 5)$
 $m = \frac{9-5}{3-0} = \frac{4}{3}$

$d = \frac{|a(x_0) - b(x_1) + c|}{\sqrt{a^2 + b^2}} = \frac{2a}{5}$

6) $f(y(x)) = \int (3x^2 + 1) dx = x^3 + x + C$
 $f(x) = 3x + 1$
 $f(y(x)) = 3y(x) + 1$

$3y(x) + 1 = x^3 + x + C$
 $3(0) + 1 = 0 + 0 + C$
 $C = 1$
 $3y(x) = x^3 + x + 1$
 $y(x) = \frac{1}{3}(x^3 + x + 1)$

7) $|\frac{1}{3}x - \frac{2}{3}| < 7$ $\rightarrow x$ max
 $|\frac{1}{3}x| < 9\frac{2}{3} + \frac{2}{3} = 10$

$\int_0^1 y(x) dx = \int_0^1 \frac{1}{3}(x^3 + x + 1) dx = \frac{1}{3} [\frac{x^4}{4} + \frac{x^2}{2} + x]_0^1 = \frac{1}{3}(\frac{1}{4} + \frac{1}{2} + 1) = 1.25$

8) $n(A \cap B) = x$ $n(A) = 8x$ $n(B) = 8x$
 $(4x - x) + (8x - x) = 1800$
 $x = 12$

9) $f(x) = 0$ \rightarrow $x = -4, 2$

$f(x) = k(x+4)(x-2)$

$f(0) = 16$

$b = -2$

$\frac{4ac - b^2}{4a} = 18$

10) $N = 8(t+1)^{-1}$

$\frac{d}{dt} N = -8(t+1)^{-2} \frac{d}{dt} (t+1)$

$\frac{dN}{dt} = \frac{-8}{(t+1)^2} = \frac{-8}{16} = -\frac{1}{2}$

9a) $\log_5 2 = -r$

$\frac{a_1(1-r)^{20}}{1-r} = \frac{a_1(1-r)^{20}}{1-r} = 17$ ②

11) $\log_5 8^{\log_5 2} = \log_5 (\frac{2^3}{5})$

$(\log_5 8^{\log_5 2}) = \log_5 8^{\log_5 2} = \log_5 2^3 \log_5 2$

invariant $\log_5 2 = a$ $2a^2 = 2 - 3a$

$2a^2 + 3a - 2 = 0$

$(2a-1)(a+2) = 0$

$a = \frac{1}{2}, -2$ $\log_5 x = \frac{1}{2} \rightarrow x = 5^{\frac{1}{2}}$

$x = 5^{\frac{1}{2}}, 5^{-2}$

$\sqrt{5}, \frac{1}{25}$

4) $\frac{1^2 \cdot 11^{10}}{12 \cdot 10}$

12) $n \cdot 10 = 40 \rightarrow n = 4$

$n \cdot 26 = 100 \rightarrow n = 4$

$n \cdot 36 = 800 \rightarrow n = 22$

$n \cdot 46 = 2100 \rightarrow n = 45$

$= 2700$

$4x - 3y + 15 = 0$

13) $\text{Stochastik } M = \frac{M+1}{2} = 20.5$

$\text{Stochastik } 20 \text{ bis } 21 \rightarrow \frac{62+0}{2} = 31$

14) n $P(A)$



$n(A) = 4$
 $n(B) = 9 \rightarrow 16$

15) $N(5) = 21 \cdot 20 \cdot 19 \cdot 18$

$N(5) = 8 \cdot 7 \cdot 6 \cdot 5$

$\text{Stochastik } = \frac{N(5)}{N(5)} = \frac{8 \cdot 7}{21 \cdot 20} = \frac{2}{5}$

$\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$

16) $n = 10$ $\mu = 10$
 $\sigma = 5$
 $P(6) = 1$

$n = 14$
 $\mu = \frac{14}{99}$

17) $n = 24$ $\mu = 14$ $\sigma = 2$
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≈ 2

18) $M_0 = 7$

$M_0 = 7$

$\bar{x} = \frac{5+6+7+7+7+9+9}{7} = 7$

$\bar{x} = 7$

19)

$M_0 = 2$

$M_0 = 2$

$\bar{x} = \frac{1+1+2+2+3+4+4}{7} = 2$

20

$n = 50$

$n = 600$

$n = 100$ $n = 150$

$n = 100$ $n = 150$

$n = 100$ $n = 150$

1) 1 8 6
 5 15 10
 7 7 9

$M = 13$

$O = 15$

$P = 16$

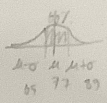
$R = 19$

$T = 20$

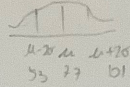
2) ?

3) $\mu = 77$ $\sigma = 65, 89$

$\sigma = 12$



4) $\mu = 53, 101$



5) 6, 10, 18, 30, 46, 66

$\frac{6}{4} + \frac{10}{1} + \frac{18}{12} + \frac{30}{11} + \frac{46}{20}$

$66 + 24 = 90$

6) 1 3 17 15 15

7) $9 \rightarrow 18$ $4 \rightarrow 28$ $24 \rightarrow 48$

8) $1 \rightarrow 3$ $7 \rightarrow 14$ $7 \rightarrow 14$ $31 \rightarrow 62$

$2^{n-1} + 2^{n-1} = 2^n$

9) ?

10) E G D H C
 5 7 4 8 3

11) ?

12) ?

13) $n = 100$

$V = \frac{S}{T}$

$\mu = 100$

$\sigma = 100$

$\frac{1}{2} \cdot 100 \cdot 10 = 1000$

$\frac{1000}{100} = 10$

14)

$320g$ 4.5×10^3

$315g$ 3.5×10^3

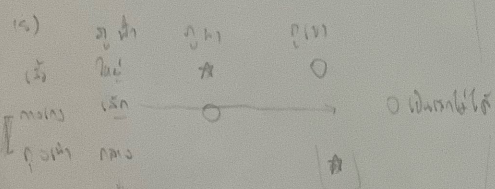
4.125×10^3

15)	2000	2000	2000	2000
1000	✓	✓		
2000			✓	✓
2000	✓			✓

1000 2000

- 16) 2000 1000 2000 7-7
 17) a) 2000 1000 2000 2000
 b) 2000 1000 2000 2000

0	0	0	0	0
2	—————	→	1	g
9	—————	→	15	
16	—————	→	20	
23	—————	→	28	↑ insipidum 20



1000 2000

- 19) 2000 1000
 20) 2000 1000

1000 2000

$CFD B = 0 A$

21) $(E, 0)$
 $516 = 11$

22) $0.975 \times 350 = 341.25 g$

$\frac{4}{341.25} \times 100 = 1.16$

24) A) $80 \pm 1.9^2 = 22.16$
 B) $77 \pm 1.8^2 = 30.46$

C) 78 ± 1.69^2
 77 ± 31

25) 5 100 200 300
 0.5 200 100 100 200 300 400 500 600 700 800 900 1000

26) 2.2 2.1 2.0 1.9 1.8 1.7 1.6 1.5 1.4 1.3 1.2 1.1 1.0 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1 0

$2 \text{ 2000} = 0.002 L = 110$

$0.02 dL$

$4 \text{ 2000} = 0.04 dL = 77.5$

27) 923 kg/m^2

$\frac{25 \text{ kg}}{1.6^2 \text{ m}^2} = 976.56$

$976.56 - 56 = 920.56$

28) 350 200 150 100 50 0

$350 \div 20 = 17.5 \text{ 2000}$

29) 2000	1000	1000	1000
1000	1000	1000	1000
1000	1000	1000	1000
1000	1000	1000	1000

60-100 2000 1000 = 1000

2000 1000 1000 1000