Q1
$$1.\frac{1}{2}n(n+1)$$
 2.O(n^2)

Q2

$$t(n) = 2^{n+1}$$

 $t(n) \le cf(n)$
 $2^{n+1} \le c \cdot 2^n$
 $2 \le c$
 $2 \le c$
 $2^{n+1} \le c \cdot 2^n$
 $2^{n+1} \le c \cdot 2^n$

Q3

Q3.
1.
$$T(n) = 7T(\frac{h}{2}) + \Theta(n^{2})$$

 $a=7$. $b=2$. $d=2$
 772^{2}
 $T(n) = \Theta(n^{1}Q^{2})$
2. $T(n) = 8T(\frac{n}{2}) + \frac{an^{2}}{2}$
 $a=8$. $b=2$. $d=2$
 872^{2}
 $T(n) = \Theta(n^{1}o8^{2})$
 $= \Theta(n^{3})$
(3) $T(n) = 2T(\frac{n}{4}) + \sqrt{n} + \frac{10b}{3}$
 $a=2$. $b=4$. $d=2$
 $2=4^{\frac{1}{2}}$
 $T(n) = \Theta(n^{\frac{1}{2}}lgn)$
 $= \Theta(\sqrt{n}lgn)$

selection sor	t							Selection Sort
	Elapsed time(milliseconds)						90000 —	Selection 301t
Data size	Average	1	2	3	4	5	80000 —	
0	0	0	0	0	0	0	\$ 70000 — 8 60000 —	
50000	2024.0638	1996.429	2055.061	2052.194	2012.93	2003.705	50000 1 1 1 1 1 1 1 1 1	
100000	8352.2248	8028.306	7996.637	8551.705	8543.085	8641.391		
150000	19569.0092	19057.373	19682.657	19743.991	19453.009	19908.016		
200000	34652.1594	34367.782	34472.151	34436.693	34948.124	35036.047	10000 —	
250000	54940.7742	55544.91	52929.189	54311.069	54476.49	57442.213	0 —	
300000	80424.8256	80758.141	81207.285	79964.352	79630.736	80563.614		0 5000 10000 15000 20000 25000 30000 配列のサイズ
								1027-777
merge sort								Merge Sort
	Elapsed time(milliseconds)						60	
Data size	Average	1	2	3	4	5		
0	0	0	0	0	0	0	spuo	
50000	9.9144	9.735	9.573	10.045	10.2	10.019	50 — 40 — 30 — 20 — 10 — 10 — 10 — 10 — 10 — 10 — 1	
100000	17.9824	17.976	17.311	18.215	18.226	18.184	E 30	
150000	26.047	26.334	25.193	25.363	27.012	26.333	虚 20	
200000	34.0744	35.716	34.017	34.977	32.831	32.831		
	41.5088	41.313	40.763	42.796	41.129	41.543	0 —	0 50000 100000 150000 200000 250000 300000
250000								