Section	Required Exercises
1.1	2, 3, 8(a,d,g), 11(a,c,e), 17, 28, 29(a,c), 31(c,e), 35(e), 40.
1.3	1(a), 3(a), 7, 9(c), 10(c), 11, 12, 14, 16, 19, 22.
1.4	1, 5, 7, 11, 14, 15, 19.
1.7	1, 3, 6, 9, 11, 15, 16, 17, 26, 31.
1.8	1,6, 9, 14, 19, 29, 34.
5.1	4, 5, 6, 8, 9, 12, 18, 20, 28, 31, 32.
5.2	**Q1**: Let $\{a_n\}$ be a sequence of integers defined inductively as: $a_1 = 1,\ a_2 = 5, a_{n+1} = 2\,a_n + 3\,a_{n-1}$, for all $n \geq 2$. Prove that: $$3^n \leq a_{n+1} \leq 2\,(3^n), for\ all\ n \geq 1$$ **Q2**: Let $\{a_n\}$ be a sequence of integers defined inductively as: $a_1 = a_2 = a_3 = 1, a_{n+2} = a_{n+1} + a_n + a_{n-1}$, for all $n \geq 2$. Prove that: a_n is an odd number for all n ≥ 1. **Q3**: Let $\{a_n\}$ be a sequence of integers defined inductively as: $a_0 = 1, a_{n+1} = a_n + 3^n$, for all $n \geq 0$. Prove that: $a_n = \frac{1}{2}(3^n + 1), for\ all\ n \geq 0$. **Q4**: Let $\{x_n\}$ be a sequence defined as: $x_1 = 1$, $x_2 = 2, x_{n+2} = \frac{1}{2}(x_{n+1} + x_n), \forall\,n \geq 1$ Prove that: $1 \leq x_n \leq 2$. **Q5**: Let $\{y_n\}$ be a sequence defined as: $y_1 = 1, y_{n+1} = \frac{1}{4}(2\,y_n + 3), \forall\,n \geq 1$. Prove that: $(a) y_n < 2$, for all $n \geq 1$. $(b)\ y_n < y_{n+1}$, for all $n \geq 1$. **Q6**: Let $\{a_n\}$ be a sequence defined as: $a_0 = 2, a_1 = 4,\ a_2 = 6, a_n = 5\,a_{n-3}, \forall\,n \geq 3$. Prove that: a_n is even, for all $n \geq 0$. **Q7**: Let $\{b_n\}$ be a sequence defined as: $$b_0 = 1, b_1 = 2, b_2 = 3, b_n = b_{n-1} + b_{n-2} + b_{n-3},$$ $$\forall\,n \geq 3$$ Prove that: $b_n < 3^n$, for all $n \geq 1$.
9.1	1, 3, 6, 10, 11, 18, 26, 30, 32, 34(a,d,e), 36(d,e,h), 41, 50, 51, 52, 53, 56.
9.3	2(c,d), 3(a,b), 4(a,c), 7(a,b), 8(a,c), 13(c), 14(a,b,c), 18, 22, 24, 26, 27, 31, 32.
9.5	1, 3, 9, 16, 21, 22, 23, 26, 28, 36, 40(a), 42, 46, 47(b), 48(a), 55, 56(a,b).
9.6	1, 6, 9, 10, 11, 14, 20, 22.
10.1	3, 4, 5, 6, 7, 8, 9, 10.
10.2	1, 2, 3, 4, 5, 6, 20(a,b,c,d), 21, 22, 23, 24, 25, 26(a,b), 35, 36, 37, 38, 39, 40, 41, 53(a,b), 59, 60.
10.3	34, 35, 36, 37, 38, 39, 53, 54, 55.
10.4	1, 2, 3, 4, 5, 6.
11.1	2, 4, 6, 10, 16, 17.
11.2	1, 2.
11.3	None
11.4	2, 3, 4, 5, 6, 7(a, b, c, e, f), 8.
12.1	1, 2, 3(a), 4(a), 5(b,d), 6(c,d), 11, 28.
12.2	1, 2(a, b), 3(a, b), 11(a, b).
12.4	1, 2, 3, 4(c), 6(a,b), 12, 13, 14.