

# 臺北市立松山家商101學年度第1次教師甄選初試

## 數學科 試題卷

一、填充題：(每題 7 分，共 63 分)

- 如右圖所示，令第  $i$  行第  $k$  個數字為  $f(i, k)$ ，此圖中之規則為  
 $f(i, 1) = 2i - 1 = f(i, i)$ ，且  $f(i, k) = f(i-1, k-1) + f(i-1, k)$ ，其中  $2 \leq k \leq i-1$ 。則  $f(i, 3)$  之值為  $\frac{1}{3}i^3 - \frac{3}{2}i^2 + \frac{25}{6}i - 3$ 。  
<img alt="A triangular arrangement of numbers. The first row has 1 number (1). The second row has 2 numbers (3, 3). The third row has 3 numbers (5, 6, 5). The fourth row has 4 numbers (7, 11, 11, 7). The fifth row has 5 numbers (9, 18, 22, 18, 9). The sixth row has 6 numbers (15, 26, 30, 22, 15, 9). The seventh row has 7 numbers (21, 36, 45, 40, 28, 15, 9). The eighth row has 8 numbers (25, 42, 56, 60, 50, 35, 15, 9). The ninth row has 9 numbers (27, 48, 63, 70, 63, 45, 20, 9, 9). The tenth row has 10 numbers (29, 54, 72, 80, 72, 54, 24, 8, 9, 9). The eleventh row has 11 numbers (31, 58, 76, 84, 80, 72, 54, 24, 8, 9, 9). The twelfth row has 12 numbers (33, 62, 80, 88, 84, 76, 60, 30, 10, 9, 9, 9). The thirteenth row has 13 numbers (35, 66, 84, 90, 88, 80, 64, 40, 12, 8, 9, 9, 9, 9). The fourteenth row has 14 numbers (37, 70, 88, 96, 92, 84, 72, 56, 32, 16, 8, 9, 9, 9, 9, 9). The fifteenth row has 15 numbers (39, 74, 92, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9, 9, 9, 9, 9, 9). The sixteenth row has 16 numbers (41, 78, 96, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9, 9, 9, 9, 9, 9, 9). The seventeenth row has 17 numbers (43, 82, 98, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9, 9, 9, 9, 9, 9, 9, 9). The eighteenth row has 18 numbers (45, 86, 102, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9, 9, 9, 9, 9, 9, 9, 9, 9). The nineteenth row has 19 numbers (47, 90, 106, 116, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9). The twentieth row has 20 numbers (49, 94, 110, 120, 116, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9). The twenty-first row has 21 numbers (51, 98, 114, 124, 120, 116, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9). The twenty-second row has 22 numbers (53, 102, 118, 128, 124, 120, 116, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9). The twenty-third row has 23 numbers (55, 106, 122, 132, 128, 124, 120, 116, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9). The twenty-fourth row has 24 numbers (57, 110, 126, 136, 132, 128, 124, 120, 116, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9). The twenty-fifth row has 25 numbers (59, 114, 130, 140, 136, 132, 128, 124, 120, 116, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9). The twenty-sixth row has 26 numbers (61, 118, 134, 144, 140, 136, 132, 128, 124, 120, 116, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9). The twenty-seventh row has 27 numbers (63, 122, 138, 148, 144, 140, 136, 132, 128, 124, 120, 116, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9). The twenty-eighth row has 28 numbers (65, 126, 142, 152, 148, 144, 140, 136, 132, 128, 124, 120, 116, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9). The twenty-ninth row has 29 numbers (67, 130, 146, 156, 152, 148, 144, 140, 136, 132, 128, 124, 120, 116, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9). The thirtieth row has 30 numbers (69, 134, 150, 160, 156, 152, 148, 144, 140, 136, 132, 128, 124, 120, 116, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9). The thirty-first row has 31 numbers (71, 138, 154, 164, 160, 156, 152, 148, 144, 140, 136, 132, 128, 124, 120, 116, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9). The thirty-second row has 32 numbers (73, 142, 158, 168, 164, 160, 156, 152, 148, 144, 140, 136, 132, 128, 124, 120, 116, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9). The thirty-third row has 33 numbers (75, 146, 162, 172, 168, 164, 160, 156, 152, 148, 144, 140, 136, 132, 128, 124, 120, 116, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9). The thirty-fourth row has 34 numbers (77, 150, 166, 176, 172, 168, 164, 160, 156, 152, 148, 144, 140, 136, 132, 128, 124, 120, 116, 112, 108, 104, 100, 96, 92, 84, 72, 56, 32, 16, 8, 9). The thirty-fifth row has 35 numbers (79, 154, 168, 178, 174, 170, 166, 162, 158, 154, 150, 146, 142, 138, 134, 130, 126, 122, 118, 114, 110, 106, 102, 98, 94, 90, 86, 82, 78, 74, 70, 66, 62, 58, 54, 50, 46, 42, 38, 34, 30, 26, 22, 18, 14, 10, 6, 2, 8, 4, 0, 2, 6, 10, 14, 18, 22, 26, 30, 34, 38, 42, 46, 50, 54, 58, 62, 66, 70, 74, 78, 82, 86, 90, 94, 98, 102, 106, 110, 114, 118, 122, 126, 130, 134, 138, 142, 146, 150, 154, 158, 162, 168, 172, 174, 178, 182, 186, 190, 194, 198, 202, 206, 210, 214, 218, 222, 226, 230, 234, 238, 242, 246, 250, 254, 258, 262, 266, 270, 274, 278, 282, 286, 290, 294, 298, 302, 306, 310, 314, 318, 322, 326, 330, 334, 338, 342, 346, 350, 354, 358, 362, 366, 370, 374, 378, 382, 386, 390, 394, 398, 402, 406, 410, 414, 418, 422, 426, 430, 434, 438, 442, 446, 450, 454, 458, 462, 466, 470, 474, 478, 482, 486, 490, 494, 498, 502, 506, 510, 514, 518, 522, 526, 530, 534, 538, 542, 546, 550, 554, 558, 562, 566, 570, 574, 578, 582, 586, 590, 594, 598, 602, 606, 610, 614, 618, 622, 626, 630, 634, 638, 642, 646, 650, 654, 658, 662, 666, 670, 674, 678, 682, 686, 690, 694, 698, 702, 706, 710, 714, 718, 722, 726, 730, 734, 738, 742, 746, 750, 754, 758, 762, 766, 770, 774, 778, 782, 786, 790, 794, 798, 802, 806, 810, 814, 818, 822, 826, 830, 834, 838, 842, 846, 850, 854, 858, 862, 866, 870, 874, 878, 882, 886, 890, 894, 898, 902, 906, 910, 914, 918, 922, 926, 930, 934, 938, 942, 946, 950, 954, 958, 962, 966, 970, 974, 978, 982, 986, 990, 994, 998, 1002, 1006, 1010, 1014, 1018, 1022, 1026, 1030, 1034, 1038, 1042, 1046, 1050, 1054, 1058, 1062, 1066, 1070, 1074, 1078, 1082, 1086, 1090, 1094, 1098, 1102, 1106, 1110, 1114, 1118, 1122, 1126, 1130, 1134, 1138, 1142, 1146, 1150, 1154, 1158, 1162, 1166, 1170, 1174, 1178, 1182, 1186, 1190, 1194, 1198, 1202, 1206, 1210, 1214, 1218, 1222, 1226, 1230, 1234, 1238, 1242, 1246, 1250, 1254, 1258, 1262, 1266, 1270, 1274, 1278, 1282, 1286, 1290, 1294, 1298, 1302, 1306, 1310, 1314, 1318, 1322, 1326, 1330, 1334, 1338, 1342, 1346, 1350, 1354, 1358, 1362, 1366, 1370, 1374, 1378, 1382, 1386, 1390, 1394, 1398, 1402, 1406, 1410, 1414, 1418, 1422, 1426, 1430, 1434, 1438, 1442, 1446, 1450, 1454, 1458, 1462, 1466, 1470, 1474, 1478, 1482, 1486, 1490, 1494, 1498, 1502, 1506, 1510, 1514, 1518, 1522, 1526, 1530, 1534, 1538, 1542, 1546, 1550, 1554, 1558, 1562, 1566, 1570, 1574, 1578, 1582, 1586, 1590, 1594, 1598, 1602, 1606, 1610, 1614, 1618, 1622, 1626, 1630, 1634, 1638, 1642, 1646, 1650, 1654, 1658, 1662, 1666, 1670, 1674, 1678, 1682, 1686, 1690, 1694, 1698, 1702, 1706, 1710, 1714, 1718, 1722, 1726, 1730, 1734, 1738, 1742, 1746, 1750, 1754, 1758, 1762, 1766, 1770, 1774, 1778, 1782, 1786, 1790, 1794, 1798, 1802, 1806, 1810, 1814, 1818, 1822, 1826, 1830, 1834, 1838, 1842, 1846, 1850, 1854, 1858, 1862, 1866, 1870, 1874, 1878, 1882, 1886, 1890, 1894, 1898, 1902, 1906, 1910, 1914, 1918, 1922, 1926, 1930, 1934, 1938, 1942, 1946, 1950, 1954, 1958, 1962, 1966, 1970, 1974, 1978, 1982, 1986, 1990, 1994, 1998, 2002, 2006, 2010, 2014, 2018, 2022, 2026, 2030, 2034, 2038, 2042, 2046, 2050, 2054, 2058, 2062, 2066, 2070, 2074, 2078, 2082, 2086, 2090, 2094, 2098, 2102, 2106, 2110, 2114, 2118, 2122, 2126, 2130, 2134, 2138, 2142, 2146, 2150, 2154, 2158, 2162, 2166, 2170, 2174, 2178, 2182, 2186, 2190, 2194, 2198, 2202, 2206, 2210, 2214, 2218, 2222, 2226, 2230, 2234, 2238, 2242, 2246, 2250, 2254, 2258, 2262, 2266, 2270, 2274, 2278, 2282, 2286, 2290, 2294, 2298, 2302, 2306, 2310, 2314, 2318, 2322, 2326, 2330, 2334, 2338, 2342, 2346, 2350, 2354, 2358, 2362, 2366, 2370, 2374, 2378, 2382, 2386, 2390, 2394, 2398, 2402, 2406, 2410, 2414, 2418, 2422, 2426, 2430, 2434, 2438, 2442, 2446, 2450, 2454, 2458, 2462, 2466, 2470, 2474, 2478, 2482, 2486, 2490, 2494, 2498, 2502, 2506, 2510, 2514, 2518, 2522, 2526, 2530, 2534, 2538, 2542, 2546, 2550, 2554, 2558, 2562, 2566, 2570, 2574, 2578, 2582, 2586, 2590, 2594, 2598, 2602, 2606, 2610, 2614, 2618, 2622, 2626, 2630, 2634, 2638, 2642, 2646, 2650, 2654, 2658, 2662, 2666, 2670, 2674, 2678, 2682, 2686, 2690, 2694, 2698, 2702, 2706, 2710, 2714, 2718, 2722, 2726, 2730, 2734, 2738, 2742, 2746, 2750, 2754, 2758, 2762, 2766, 2770, 2774, 2778, 2782, 2786, 2790, 2794, 2798, 2802, 2806, 2810, 2814, 2818, 2822, 2826, 2830, 2834, 2838, 2842, 2846, 2850, 2854, 2858, 2862, 2866, 2870, 2874, 2878, 2882, 2886, 2890, 2894, 2898, 2902, 2906, 2910, 2914, 2918, 2922, 2926, 2930, 2934, 2938, 2942, 2946, 2950, 2954, 2958, 2962, 2966, 2970, 2974, 2978, 2982, 2986, 2990, 2994, 2998, 3002, 3006, 3010, 3014, 3018, 3022, 3026, 3030, 3034, 3038, 3042, 3046, 3050, 3054, 3058, 3062, 3066, 3070, 3074, 3078, 3082, 3086, 3090, 3094, 3098, 3102, 3106, 3110, 3114, 3118, 3122, 3126, 3130, 3134, 3138, 3142, 3146, 3150, 3154, 3158, 3162, 3166, 3170, 3174, 3178, 3182, 3186, 3190, 3194, 3198, 3202, 3206, 3210, 3214, 3218, 3222, 3226, 3230, 3234, 3238, 3242, 3246, 3250, 3254, 3258, 3262, 3266, 3270, 3274, 3278, 3282, 3286, 3290, 3294, 3298, 3302, 3306, 3310, 3314, 3318, 3322, 3326, 3330, 3334, 3338, 3342, 3346, 3350, 3354, 3358, 3362, 3366, 3370, 3374, 3378, 3382, 3386, 3390, 3394, 3398, 3402, 3406, 3410, 3414, 3418, 3422, 3426, 3430, 3434, 3438, 3442, 3446, 3450, 3454, 3458, 3462, 3466, 3470, 3474, 3478, 3482, 3486, 3490, 3494, 3498, 3502, 3506, 3510, 3514, 3518, 3522, 3526, 3530, 3534, 3538, 3542, 3546, 3550, 3554, 3558, 3562, 3566, 3570, 3574, 3578, 3582, 3586, 3590, 3594, 3598, 3602, 3606, 3610, 3614, 3618, 3622, 3626, 3630, 3634, 3638, 3642, 3646, 3650, 3654, 3658, 3662, 3666, 3670, 3674, 3678, 3682, 3686, 3690, 3694, 3698, 3702, 3706, 3710, 3714, 3718, 3722, 3726, 3730, 3734, 3738, 3742, 3746, 3750, 3754, 3758, 3762, 3766, 3770, 3774, 3778, 3782, 3786, 3790, 3794, 3798, 3802, 3806, 3810, 3814, 3818, 3822, 3826, 3830, 3834, 3838, 3842, 3846, 3850, 3854, 3858, 3862, 3866, 3870, 3874, 3878, 3882, 3886, 3890, 3894, 3898, 3902, 3906, 3910, 3914, 3918, 3922, 3926, 3930, 3934, 3938, 3942, 3946, 3950, 3954, 3958, 3962, 3966, 3970, 3974, 3978, 3982, 3986, 3990, 3994, 3998, 4002, 4006, 4010, 4014, 4018, 4022, 4026, 4030, 4034, 4038, 4042, 4046, 4050, 4054, 4058, 4062, 4066, 4070, 4074, 4078, 4082, 4086, 4090, 4094, 4098, 4102, 4106, 4110, 4114, 4118, 4122, 4126, 4130, 4134, 4138, 4142, 4146, 4150, 4154, 4158, 4162, 4166, 4170, 4174, 4178, 4182, 4186, 4190, 4194, 4198, 4202, 4206, 4210, 4214, 4218, 4222, 4226, 4230, 4234, 4238, 4242, 4246, 4250, 4254, 4258, 4262, 4266, 4270, 4274, 4278, 4282, 4286, 4290, 4294, 4298, 4302, 4306, 4310, 4314, 4318, 4322, 4326, 4330, 4334, 4338, 4342, 4346, 4350, 4354, 4358, 4362, 4366, 4370, 4374, 4378, 4382, 4386, 4390, 4394, 4398, 4402, 4406, 4410, 4414, 4418, 4422, 4426, 4430, 4434, 4438, 4442, 4446, 4450, 4454, 4458, 4462, 4466, 4470, 4474, 4478, 4482, 4486, 4490, 4494, 4498, 4502, 4506, 4510, 4514, 4518, 4522, 4526, 4530, 4534, 4538, 4542, 4546, 4550, 4554, 4558, 4562, 4566, 4570, 4574, 4578, 4582, 4586, 4590, 4594, 4598, 4602, 4606, 4610, 4614, 4618, 4622, 4626, 4630, 4634, 4638, 4642, 4646, 4650, 4654, 4658, 4662, 4666, 4670, 4674, 4678, 4682, 4686, 4690, 4694, 4698, 4702, 4706, 4710, 4714, 4718, 4722, 4726, 4730, 4734, 4738, 4742, 4746, 4750, 4754, 4758, 4762, 4766, 4770, 4774, 4778, 4782, 4786, 4790, 4794, 4798, 4802, 4806, 4810, 4814,