WORKSHEET IX: MORE PARTITION GENERATING FUNCTIONS

MARCH 8, 2004

Give the generating function for the following sequences of numbers.

(1) the number of partitions of n with parts that are multiples of 3.

(2) the number of partitions of n with only even parts and all parts not occurring more than twice.

(3) the number of partitions of n with distinct parts which are all congruent to 1 or 4 (mod 5).

(4) the number of partitions of n with parts of size 1, 2 or 3 occurring at most 8 times each.

(5) the number of partitions of n with at most 8 parts of any given size.

(6) the number of partitions of n with even parts and 0, 1 or 2 parts of any given size.

(7) the number of partitions of n with a Durfee square of odd size.

(8) the number of partitions of n with distinct parts and no parts are equivalent to 3 (mod 5).

(9) the number of partitions of n with less than or equal to k parts and each part occurs at most 4 times.

(10) the number of partitions of n with with odd parts and a part will either occur 0 or an odd number of times.

(11) the number of partitions of n into parts congruent to 2 or 3 (mod 5).

(12) the number of partitions of n with length less than or equal to 5 and a Durfee square of size 1, 3 or 5.

(13) the number of partitions of n with a Durfee square of odd size and all parts even.

(14) the number of partitions of n with Durfee square equal to 3 and all odd parts.

(15) the number of partitions of n with length exactly equal to 4.

(16) the number of partitions of n with less than or equal to k parts and each part occurs an even number of times.

(17) the number of partitions of n with no parts that are equivalent to 3 (mod 5).

(18) the number of partitions of n with a Durfee square of square of size 1, 2 or 3.

(19) the number of partitions of n with Durfee square equal to 4 and all distinct parts.

(20) the number of partitions of n with distinct parts and all parts are equivalent to 3 (mod 5).

(21) the number of partitions of n with length exactly equal to 5 and all parts distinct.

(22) the number of partitions of n with even parts and all parts occurring an even number of times.

(23) the number of partitions of n with odd parts and all parts occurring an even number of times.

(24) the number of partitions of n with a Durfee square of size 3 and the length of the partition less than or equal to 4.

(25) the number of partitions of n with distinct parts, a Durfee square of size 3 and length equal to 3.

(26) the number of partitions of n with less than or 4 parts and all parts distinct.

(27) the number of partitions of n with even parts occurring an even number of times and odd parts occurring any number of times.

(28) the number of partitions of n with Durfee square equal to 3 and all even parts.

(29) the number of partitions of n with length less than or equal to 3 and all parts distinct.

(30) the number of partitions of n with odd parts and each part occurs at most 4 times.

(31) the number of partitions of n with length exactly equal to 4 and all parts distinct.

(32) the number of partitions of n with a Durfee square of even size and all parts even.