

1. How many 5-card hands (from a 52-card deck—see page 708) with 1 spade, 2 hearts, and 2 other cards from remaining suits can be dealt? (remember: suits are spades, hearts, clubs, and diamonds)

**329,550**

$$\frac{13^C_1}{\text{spade}} \times \frac{13^C_2}{\heartsuit} \times \frac{26^C_2}{\text{others}}$$

2. How many ways can 3 marbles be selected from a bag containing 4 green and 5 red marbles if all marbles must be the same color?

**14**

$$\frac{4^C_3}{3G} + \frac{5^C_3}{3R}$$

3. The first three terms of  $(x-y)^{22}$  are  $x^{22} - 22x^{21}y + 231x^{20}y^2$ . Write the last three terms.

$$\dots + 231x^2y^{20} - 22xy^{21} + y^{22}$$

Use the Binomial Theorem for #4 and #5.

4. Find the eighth term of  $(2x-3)^{15}$ .  $r=0$

$$-3,602,776,320x^8$$

$$\frac{15!}{7!8!} (2x)^8 (-3)^7$$

5. Write the first four terms of  $(1+2x)^{16}$ .

$$1 + 32x + 480x^2 + 4480x^3$$

$$1 \binom{16}{0} + \frac{16!}{15!1!} \binom{16}{1} (2x)^1 + \frac{16!}{14!2!} \binom{16}{2} (2x)^2 + \frac{16!}{13!3!} \binom{16}{3} (2x)^3$$

**page 712 ans. not in back of book**

26. 792

$$28. \frac{48!}{1!47!} \times \frac{48!}{4!44!} = 4 \cdot \frac{48!}{4!44!}$$

28. 778,320

$$13 \times 1 \times 48$$

30. 624

$$= \binom{13}{\text{Kinds}} \left( \frac{4^C_4}{\text{4 of 1 kind}} \times \frac{48^C_1}{\text{another 1}} \right) =$$

44. 189

$$44. (x-3)^7 = \frac{7!}{5!2!} (x)^5 (-3)^2$$

48. 1365

$$26 \binom{13}{\text{face cards}}^C_5 \frac{12!}{5!7!}$$

57. permutation, 43680

53.

$$10^C_3 + 10^C_4 + 10^C_5 + 10^C_6 + 10^C_7 + 10^C_8 + 10^C_9 + 10^C_{10}$$

$$= \frac{10 \cdot 9 \cdot 8}{6 \cdot 5 \cdot 4} + \frac{10 \cdot 9 \cdot 8 \cdot 7}{4 \cdot 3 \cdot 2 \cdot 1} + 45 + 10 + 1$$

$$120 + 210 + 120 + 120 + 45 + 10 + 1$$