Page 363 #15 ${}_8P_3 = 336$ 2nd question $8!$ or ${}_8P_8 = 40320$

#16 $\frac{{}_5P_5}{5} = \frac{120}{5} = 24$ or $(5-1)! = 24$

#17 ${}_{12}C_4 \times {}_{10}C_4 = 495 \times 210 = 103950$

#18 20 ↙ 4 wins → needs 6 more wins out of 8 games ${}_8C_6 = 28$

#19 $\frac{1}{{}_{10}C_4}$ #20 $\frac{1}{{}_7C_4} = \frac{1}{35}$ #21 $\frac{1}{5P_3} = \frac{1}{10}$

#22 $\frac{{}_4C_3}{{}_6C_3} = \frac{4}{20} = .2$

#23 $\frac{{}_7C_3}{{}_{12}C_3} = \frac{35}{226}$ #24 a) $\frac{1}{{}_{16}C_4} = \frac{1}{1820}$

#24 b) $\frac{{}_4C_4 + {}_5C_4 + {}_6C_4}{{}_{16}C_4} = \frac{1+5+15}{1820} = \frac{21}{1820} = \frac{3}{260}$

#25 $\frac{{}_3C_3 \times {}_4C_1}{{}_7C_4} = \frac{1 \times 4}{35} = \frac{4}{35}$

#26 a) $\frac{{}_4C_4}{{}_{10}C_4} = \frac{1}{210}$ b) $\frac{{}_4C_2 \cdot {}_6C_2}{{}_{10}C_4} = \frac{6 \times 15}{210} = \frac{90}{210}$

#27 $\frac{5}{5P_3} = \frac{5}{195054}$