

FST 10.1, 10.3, 10.5 Quiz Review 2

Name _____

1) Evaluate ${}_{13}C_7$. (Do you know how to use the formula?)

$$\frac{{}_{13}P_7}{7!} = \frac{13 \cdot 12 \cdot 11 \cdot 10 \cdot 9 \cdot 8 \cdot 7}{7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1} = \frac{84840}{5040} = \boxed{1716}$$

2) In a classroom there are 16 girls and 12 boys. In how many ways can 4 girls and 2 boys be chosen to join a decorating committee?

$${}_{16}C_4 \cdot {}_{12}C_2 = \boxed{106120}$$

3) From a deck of 52 cards, 5 cards are drawn. What is the probability that 3 cards are Kings and 2 are Aces?

$$\frac{{}_4C_3 \cdot {}_4C_2}{{}_{52}C_5} = \frac{24}{2598960} = \boxed{\begin{array}{l} 9.23 \times 10^{-6} \\ 9.23 \times 10^{-4} \% \end{array}}$$

4) A bag has 10 green blocks and 8 purple blocks. If 6 blocks are picked out, what is the probability that exactly 4 are green and 2 are purple?

$$\frac{{}_{10}C_4 \cdot {}_8C_2}{{}_{18}C_6} = \frac{5880}{18524} = \boxed{\begin{array}{l} 0.3167 \\ 31.67\% \end{array}}$$

5) Expand $(c+d)^6$.

$${}^6C_0 c^6 d^0 + {}^6C_1 c^5 d^1 + {}^6C_2 c^4 d^2 + {}^6C_3 c^3 d^3 + {}^6C_4 c^2 d^4 + {}^6C_5 c^1 d^5 + {}^6C_6 c^0 d^6$$

$$\boxed{1c^6 + 6c^5d + 15c^4d^2 + 20c^3d^3 + 15c^2d^4 + 6cd^5 + 1d^6}$$

6) Find the power of y and the coefficient of the x^3 term in $(x+y)^9$.

$$\begin{aligned} & \rightarrow \boxed{6} \\ & {}^9C_6 x^3 y^6 \quad \rightarrow \boxed{84} \\ & \boxed{84} x^3 y^6 \end{aligned}$$

7) Suppose that the probability of a graphing calculator that was manufactured in a certain factory being defected is 5%. What is the probability that exactly 10 graphing calculators are defective in a shipment of 100 graphing calculators from this factory?

$${}^{100}C_{10} (0.05)^{10} (0.95)^{90} = \boxed{\begin{matrix} 0.0167 \\ 1.67\% \end{matrix}}$$

8) Find the probability that at least 8 out of 10 students will pass Pre Calc, given that the probability of passing Pre Calc is 93%?

$$\begin{aligned} & {}^{10}C_8 (.93)^8 (.07)^2 + {}^{10}C_9 (.93)^9 (.07)^1 + {}^{10}C_{10} (.93)^{10} (.07)^0 \\ & = 0.1234 + 0.3643 + 0.4840 \\ & = \boxed{0.9717 = 97.17\%} \end{aligned}$$