Pre-Calculus Chapter 10 Review (10-1, 10-3 & 10-5) Name_____

1) Evaluate ${}_{11}C_4$. Show your work using the formula, then check with a calculator.

$$\frac{{}_{11}P_4}{4!} = \frac{11 \cdot 10 \cdot 9 \cdot 8}{4 \cdot 3 \cdot 2 \cdot 1} = \frac{7920}{24} = \boxed{330}$$

2) Which will give a bigger number, ${}_5C_3$ or ${}_5P_3$? Explain why.

Permutation, because order matters.

${}_5C_3 = 10$ ${}_5P_3 = 60$

3) Three students are being chosen from a class of 25 to attend a leadership conference.

a) Combination or Permutation?

b) Set up and solve.

${}_{25}C_3 = \boxed{2300}$

4) Three players from a 13 member basketball team are chosen as captain, most improved, and MVP.

a) Combination or Permutation?

b) Set up and solve.

${}_{13}P_3 = \boxed{1716}$

5) The probability that a seed will germinate is 75%. What is the probability that exactly 6 of 10 seeds will germinate?

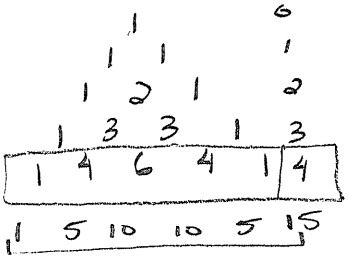
${}_{10}C_6 (.75)^6 (.25)^4 = \boxed{0.146 = 14.6\%}$

6) Eight cards are chosen from a deck of 52. Find the probability of choosing exactly 3 Kings, 2 Queens, and 3 Aces.

$$\frac{{}_4C_3 \cdot {}_4C_2 \cdot {}_4C_3}{{}_{52}C_8} = \frac{96}{752,538,150} = \boxed{1.28 \times 10^{-7} = 1.28 \times 10^{-5}\%}$$

7) If you were to expand $(a+b)^4$, what are the coefficients of your answer?

1, 4, 6, 4, 1



8) What is the power of "y" in the x^4 term of $(x+y)^9$?

$x^4 y^{\boxed{5}}$

9 or 10 correct

9) What is the probability of getting a 90% or better on a true or false quiz with 10 questions?

$_{10}C_9(.5)^9(.5)^1 + {}_{10}C_{10}(.5)^{10}(.5)^0 = \boxed{0.0107}$

$= \boxed{1.07\%}$

0 or 1 correct

10) What is the probability of getting lower than a 20% on a 10-question multiple choice quiz? Each question has 4 choices.

$_{10}C_0(.25)^0(.75)^{10} + {}_{10}C_1(.25)^1(.75)^9 = \boxed{0.244}$

$= \boxed{24.4\%}$

11) What is the power of "x" in the y^5 term of $(x+y)^{12}$?

$\boxed{7}$

x^7y^5

12) What is the coefficient of the x^4 term in $(x+y)^5$?

$_5C_1 x^4y^1 = \boxed{5}x^4y^1$

13) If you were to expand $(a+b)^{12}$, what would be the coefficient on the b^8 term?

$_{12}C_8 a^4b^8 = \boxed{495}a^4b^8$

$(2-5(3))^4 = 28,561$ ✓ ★ Check using $x=2, y=3$.

14) Expand $(x-5y)^4$.

$\overset{1}{4}C_0(x)^4(-5y)^0 + \overset{4}{4}C_1(x)^3(-5y)^1 + \overset{6}{4}C_2(x)^2(-5y)^2 + \overset{4}{4}C_3(x)^1(-5y)^3 + \overset{1}{4}C_4(x)^0(-5y)^4$

$= 1x^4 + 4x^3(-5y) + 6x^2(25y^2) + 4x(-125y^3) + 1(625)y^4$

$= x^4 - 20x^3y + 150x^2y^2 - 500xy^3 + 625y^4 = 28561$ ✓

15) Expand $(x-4y)^5$.

$\overset{1}{5}C_0(x)^5(-4y)^0 + \overset{5}{5}C_1(x)^4(-4y)^1 + \overset{10}{5}C_2(x)^3(-4y)^2 + \overset{10}{5}C_3(x)^2(-4y)^3 + \overset{5}{5}C_4(x)^1(-4y)^4 + \overset{1}{5}C_5(x)^0(-4y)^5$

$= 1x^5 + 5x^4(-4y) + 10x^3(16y^2) + 10x^2(-64y^3) + 5x(256y^4) + 1(-1024)y^5$

$= x^5 - 20x^4y + 160x^3y^2 - 640x^2y^3 + 1280xy^4 - 1024y^5$

★ Check using $x=2, y=3$

$(2-4(3))^5 = -100,000$ ✓ $= -160,000$ ✓