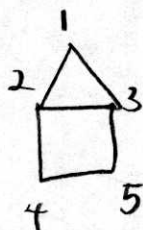


REAL QUIZ 10

Name: Many Ezeifeoma
 RUID: 204005314
 no3@scarletmail.rutgers.edu

1) In many ways can you color with 10 colors this graph.



✓ (8)

Solution: Recall $P_G(k) = P_{G-e}(k) + P_{G|e}(k)$

$$P(\text{House}) = P(\text{Square with triangle on top}) = P(\text{Square}) - P(\text{Square}) = (P(\text{Square with dot}) - P(\text{Square})) - P(\text{Square})$$

$$P(C_4) = P(\text{Square}) - P(C_3) = k(k-1)^3 - k(k-1)(k-2)$$

$$\therefore P(\text{House}) = k(k(k-1)^3 - k(k-1)(k-2)) - [k(k-1)^3 - k(k-1)(k-2)]$$

\therefore For 10 colors ; $\therefore k = 10$

$$P_G(10) = 10 [10(9)^3 - 10(9)(8)] - [10(9)^3 - 10(9)(8)] - [10(9)^3 - 10(9)(8)]$$

$$= 10(7290 - 720) - [7290 - 720] - [7290 - 720] = 65700 - 6570 - 6570 = 52560 \text{ ways} = P_G(10)$$

Handwritten calculations:

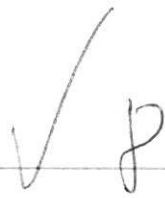
$$\begin{array}{r} 164 \\ + 8 \\ \hline 172 \end{array}$$

$$\begin{array}{r} 81 \\ \times 9 \\ \hline 729 \\ - 720 \\ \hline 90 \end{array}$$

$$\begin{array}{r} 65700 \\ - 13140 \\ \hline 52560 \end{array}$$

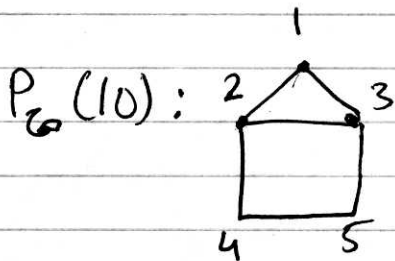
$$\begin{array}{r} 6570 \\ + 6570 \\ \hline 13140 \end{array}$$

Quiz #10



Name: Vishal Agarwal

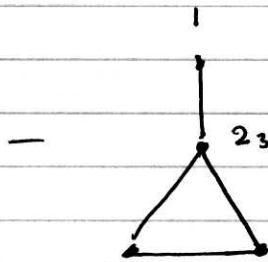
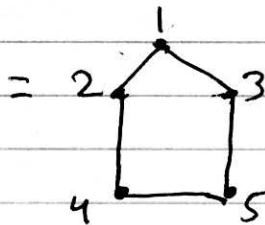
Email: va256@scarletmail.rutgers.edu



remove edge 2,3

$G - \{2,3\}$

$$P_G(10) = P_{G - \{2,3\}}(10) - P_{G/\{2,3\}}(10)$$



$= (k-1)^5 + (-1)^5(k-1) - P_{G/\{2,3\}}(10)$

$P_{G_n} = (k-1)^n + (-1)^n(k-1)$

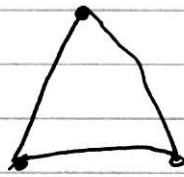
591040
 $-$ 7200
 51840
 $+$ 720
 81560
 \cdot 9
 27294
 \cdot 9
 6561
 \cdot 9
 59049



\Rightarrow



$-$



$= k \cdot k \cdot (k-1)(k-2) - k \cdot (k-1)(k-2)$

$= (k-1)^5 - (k-1) - [k^2(k-1)(k-2) - k(k-1)(k-2)]$

$= \frac{9^5}{9} - \frac{9}{7200} - \frac{10^2 \cdot 9 \cdot 8}{720} + \frac{10 \cdot 9 \cdot 8}{720} = 54040 - 7200 + 720 = 52560$