

ECE 131A Quiz 1

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Problem 1

(a)

For a specific color of paint there is only 1 way to paint the rocks, so for the 3 paints there is 3 ways to paint the rocks. Therefore the probability of all the rocks being the same color is

$$\frac{3}{3^6} = \frac{1}{3^5} = \boxed{0.004115226337}$$

(b)

For any two colors there are 2^6 ways to paint the rocks, but we need to subtract 2 for the 2 ways to paint the rocks with the same color. Therefore, since there is 3 paints there is $\binom{3}{2}$ ways to choose 2 paint colors, Therefore the probability is

$$\frac{\binom{3}{2}(2^6 - 2)}{3^6} = \boxed{0.2551440329}$$

(c)

For all three colors of paint, there are 3^6 ways to paint the rocks but we will need to subtract the $\binom{3}{2}(2^6 - 2)$ to paint the rocks exactly 2 colors and the 3 ways to paint the rocks one color, so we will have the probability is

$$\frac{3^6 - 3 - \binom{3}{2}(2^6 - 2) - 3}{3^6} = \boxed{0.7407407407}$$