CS 230, Quiz 3

Solutions

You will have 5 minutes to complete this quiz. No books, notes, or other aids are permitted.

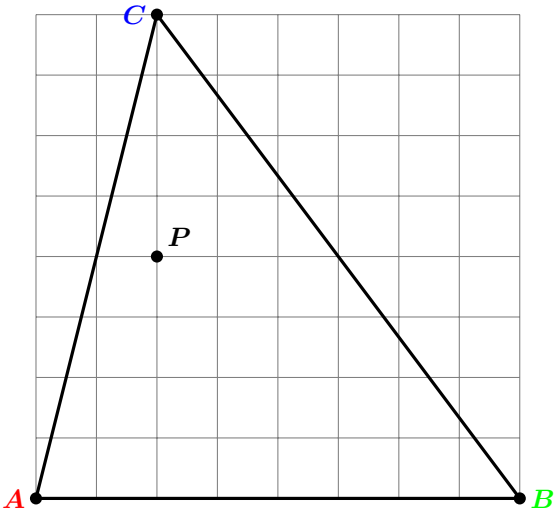
Problem 1

Correct the orientations of the following triangles so that their orientations are consistent: $(0,1,3), (1,3,4), (1,2,4), (1,2,5), (0,1,5)$. (The numbers are indices into the vertex list.)

Adjusting the orientations to be consistent with the first: $(0,1,3), (1,4,3), (1,2,4), (1,5,2), (0,5,1)$.

Problem 2

The triangle below is to be rasterized. The colors of the vertices are A = yellow = $(1,1,0)$, B = cyan = $(0,1,1)$ and, C = violet = $(1,0,1)$. (1) Compute the barycentric weights of P, and (2) compute the color of the point P.



$$\text{area}(ABC) = 32 \qquad \text{area}(APC) = 4 \qquad \text{area}(ABP) = 16$$
$$\text{area}(PBC) = 12$$

$$\alpha = \frac{\text{area}(PBC)}{\text{area}(ABC)} = \frac{3}{8} \qquad \beta = \frac{\text{area}(APC)}{\text{area}(ABC)} = \frac{1}{8} \qquad \gamma = \frac{\text{area}(ABP)}{\text{area}(ABC)} = \frac{1}{2}$$

$$C_P = \alpha C_A + \beta C_B + \gamma C_C = \left(\frac{7}{8}, \frac{1}{2}, \frac{5}{8}\right)$$