Colors

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1.
a) black
b) red
c) green
d) yellow
e) blue
f) purple
g) Cyan
h) white

2.
a) $\langle \frac{1}{2}, \frac{1}{2}, \frac{1}{2} \rangle$ for gray since its between white and black

b) $\langle 1, \frac{1}{2}, \frac{1}{2} \rangle$ for pink since we must lighten red with white

c) $\langle 0, \frac{1}{2}, 1 \rangle$ since navy blue is ~~lightened blue~~ between blue and cyan

d) $\langle 1, \frac{1}{2}, 0 \rangle$ since orange is between yellow and red

e) $\langle 0, \frac{1}{2}, 0 \rangle$ since forest green is a darker green

f) $\langle \frac{1}{2}, 0, \frac{1}{2} \rangle$ since dark purple must supply less color than normal purple

g) $\langle \frac{1}{2}, 1, \frac{1}{2} \rangle$ light green has more "color" than normal green which appears lighter now

3.
a) This would allow someone to see more variations in individual colors, potentially seeing more of the light spectrum

b) Have two markers that seem to be the same color in tri-color eyes, but are different to quad-color eyes. Then have a tri-color participant label two different squares and have the quad-color participant differentiate between them.

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Ray tracing

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(4) $$\boxed{h_p = W_p = \frac{W}{\omega}}$$

(5) $$\boxed{h = H \cdot h_p}$$

(6) $$\boxed{n = \frac{c - e}{\|c - e\|}}$$

(7) $$\boxed{\begin{aligned} \vec{u} &= n \times S \\ \vec{v} &= n \times \vec{u} \end{aligned}}$$

(8) $$\boxed{\begin{aligned} \frac{\vec{u}}{\|\vec{u}\|} \cdot \omega_p &= u \\ \frac{\vec{v}}{\|\vec{v}\|} \cdot h_p &= v \end{aligned}}$$

(9) $$\cancel{p = c + \frac{h}{2} \cdot \vec{u} + \frac{w}{2} \cdot \vec{v}}$$

$$p = c - \frac{h}{2} \cdot \vec{u} - \frac{w}{2} \cdot \vec{v}$$

(10) $$\boxed{x = p + (i + 0.5)\vec{u} + (j + 0.5)\vec{v}}$$

(11) Endpoint: e

Direction: $\dfrac{x - e}{\|x - e\|}$