

$$\begin{aligned} X &= 12.2430574 * r + 44.4548 * g + 6.5701 * b \\ Y &= 4.6321 * r + 44.6748 * g + 9.5109 * b \\ Z &= 0.5227 * r + 4.69 * g + 44.8061 * b \end{aligned}$$

$$\begin{aligned} cpX &= 63.2679 \\ cpY &= 58.8178 \\ cpZ &= 50.0188 \end{aligned}$$

$$\begin{aligned} sclTX &= 0.0914 \\ sclTY &= 0.007009 \\ sclTZ &= 0.0 \end{aligned}$$

Simulation

Protanope

$$Y / Z < cpY / cpZ$$

check

Yes

$$\begin{aligned} TX &= cpY * sclPZ - cpZ * sclPY; \\ TY &= cpZ * sclPX - cpX * scpPZ; \\ TZ &= cpX * sclPY - cpY * sclPX; \end{aligned}$$

No

$$\begin{aligned} TX &:= cpY * sclAPZ - cpZ * sclAPY; \\ TY &:= cpZ * sclAPX - cpX * sclAPZ; \\ TZ &:= cpX * sclAPY - cpY * sclAPX; \end{aligned}$$

$$X = -(TY * Y + TZ * Z) / TX$$

Simulation

Deuteranope

$$Z / X < cpZ / cpX$$

check

Yes

$$\begin{aligned} TX &= cpY * sclPZ - cpZ * sclPY; \\ TY &= cpZ * sclPX - cpX * scpPZ; \\ TZ &= cpX * sclPY - cpY * sclPX; \end{aligned}$$

No

$$\begin{aligned} TX &:= cpY * sclAPZ - cpZ * sclAPY; \\ TY &:= cpZ * sclAPX - cpX * sclAPZ; \\ TZ &:= cpX * sclAPY - cpY * sclAPX; \end{aligned}$$

$$Y = -(TX * X + TZ * Z) / TY$$

Simulation

Tritanope

$$Y / X < cpY / cpX$$

check

Yes

$$\begin{aligned} TX &= cpY * sclTZ - cpZ * sclTY; \\ TY &= cpZ * sclTX - cpX * scpTZ; \\ TZ &= cpX * sclTY - cpY * sclTX; \end{aligned}$$

No

$$\begin{aligned} TX &:= cpY * sclATZ - cpZ * sclATY; \\ TY &:= cpZ * sclATX - cpX * sclATZ; \\ TZ &:= cpX * sclATY - cpY * sclATX; \end{aligned}$$

$$Z = -(TX * X + TY * Y) / TZ$$

$$\begin{aligned} sclAPX &= 0.08008 \\ sclAPY &= 0.1579 \\ sclAPZ &= 0.5897 \end{aligned}$$

$$\begin{aligned} sclATX &= 0.1284 \\ sclATY &= 0.2237 \\ sclATZ &= 0.3636 \end{aligned}$$

$$\begin{aligned} sclPX &= 0.9856 \\ sclPY &= 0.7325 \\ sclPZ &= 0.00108 \end{aligned}$$

$$\begin{aligned} r &= 0.13096 * X - 0.13122 * Y + 0.0086511 * Z \\ g &= -0.01355 * X + 0.03648 * Y - 0.0057552 * Z \\ b &= -0.0001089 * X - 0.002287 * Y + 0.02282 * Z \end{aligned}$$