$$F(\vec{r}, R, \beta) = \frac{(\beta^2 + 1) \cdot precision(\vec{r}) \cdot recall(\vec{r}, R)}{(\beta^2 \cdot precision(\vec{r})) + recall(\vec{r}, R)}$$

$$F1(\vec{r}, R) = F(\vec{r}, R, 1)$$

$$= \frac{2 \cdot precision(\vec{r}) \cdot recall(\vec{r}, R)}{precision(\vec{r}) + recall(\vec{r}, R)}$$