

## Pergunta 8

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pacman::p_load(pacman, readxl, ggplot2, magrittr, ggthemes)

set.seed(1526)

prob <- 1:177 / (177 + 1)
quantiles_cauchy <- qcauchy(prob, location = 1.4, scale = 1.2)
quantiles_normal <- qnorm(prob, mean = 1.2, sd = sqrt(3.4))
sample_cauchy <- sort(rcauchy(177, scale = 1.2, location = 1.4))
data_cauchy <- data.frame(sample_cauchy, quantiles_cauchy)
data_normal <- data.frame(sample_cauchy, quantiles_normal)

cols <- c("samples", "quantiles")
colnames(data_cauchy) <- cols
colnames(data_normal) <- cols

ggplot() +
  geom_point(data = data_cauchy, aes(x = quantiles, y = samples, color = "Cauchy"),
            size = 1) +
  geom_point(data = data_normal, aes(x = quantiles, y = samples, color = "Normal"),
            size = 1) +
  geom_abline(intercept = 0, slope = 1, color = "#f93f3f") +
  ggtitle("Quantis de Probabilidade vs Amostra Cauchy") +
  xlab("Quantis de Probabilidade") + ylab("Valores gerados ordenados") +
  scale_color_manual(values = c("#23b1ee", "#000000", "#f93f3f"),
                    labels = c("Cauchy", "Normal", "Bissectriz")) +
  labs(color = "Legenda:") + theme_minimal() +
  theme(plot.title = element_text(size = 10, face = "bold"),
        legend.title = element_text(size = 10, face = "bold"))
```

