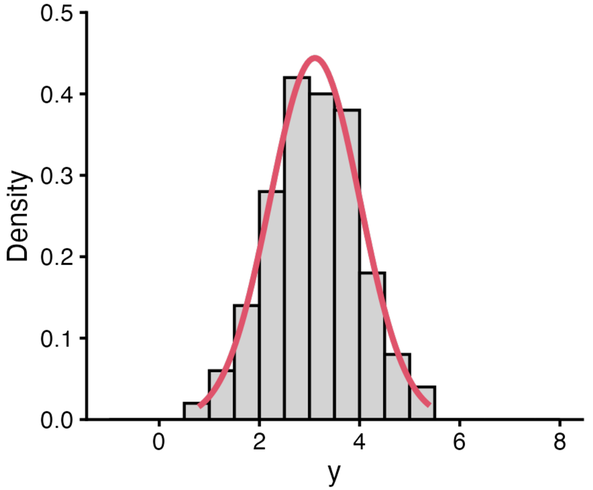
Other ways of fitting the linear model

lm() function for linear models

- The lm() function in R can fit most of the models we saw with OLS using a formula notation
  - R formulas:
    - $y \sim 1$ (y as a function of a constant)
    - $y \sim x$ (y as a function of x, same as $1 + x$)
- OLS assumes fixed uniform priors, so we can't change them

$$y_i \sim N(\mu_i, \sigma)$$
$$\mu_i = \alpha$$




```
> df <- data.frame(y = rnorm(100, 3, 1))

# OLS model:
> ols_fit = lm(y ~ 1, data = df)
> precis(ols_fit, prob = 0.95)
             mean  sd 2.5% 97.5%
(Intercept) 3.03 0.1 2.83  3.24
> (summary(ols_fit)$sigma)
[1] 1.037191
```

α

σ

Other ways of fitting the linear model

lm() function for linear models

$$y_i \sim N(\mu_i, \sigma)$$

$$\mu_i = \alpha + \beta x_i$$

```
> df <- data.frame(growth = c(12, 10, 8, 11, 6, 7, 2, 3, 3),
                   tannin = c(0, 1, 2, 3, 4, 5, 6, 7, 8))
> df$tannin = scale(df$tannin, scale = FALSE)
> df$growth = scale(df$growth, scale = FALSE)

> ols_fit = lm(growth ~ tannin, data = df)
> precis(ols_fit)
               mean   sd  5.5% 94.5%
(Intercept)    0.00 0.56 -0.90  0.90
tannin        -1.22 0.22 -1.57 -0.87
```

α

β