1. In a generalized additive model, if a smooth term has an effective degrees of freedom close to 1, then that term should enter linearly into the model.

   True

   False

2. The tests in the summary of the `gam()` function (in the mgcv package) associated with the smooth terms are (approximately) F-tests that test the hypothesis that the given smooth term is zero vs nonzero.

   True

   False

3. The adjusted R^2 is reported as a percentage, and is equal to $R^2 = 1 - \frac{RD}{ND}$, where RD is the residual deviance and ND is the null deviance.

   True

   False

4. In the context of generalized additive models, the adjusted R^2 is reasonable to use for model comparisons.

   True

   False

5. The trees data frame has 31 observations on 3 variables.

   1. **Girth**: Tree diameter in inches
   2. **Height**: Height in ft
   3. **Volume**: Volume of timber in cubic ft

   Consider a GAM fit to the data, where Volume is the response and Girth and Height are predictors.

```
Family: Gamma
Link function: log

Formula:
Volume ~ s(Height) + s(Girth)

Parametric coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  3.27570    0.01492   219.6   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Approximate significance of smooth terms:
            edf Ref.df      F  p-value
s(Height) 1.000  1.000  31.32 3.92e-06 ***
s(Girth)  2.422  3.044 219.28  < 2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

R-sq.(adj) =  0.973   Deviance explained = 97.8%
GCV = 0.0080824  Scale est. = 0.006899  n = 31
```

   Height should stay in the model nonparametrically.

   True

   False

   The small p-value associated with Girth suggests that it should enter the model nonparametrically.

   True

   False