CER Power Analysis

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Install and Load pwr package

```
## install.packages("pwr")
library(pwr)
```

Conduct a power analysis to DETERMINE SAMPLE SIZE needed for an RCT

Note that we provide effect size and power, therefore n is estimated

```
pwr.t.test(d=0.56, power=0.80, type="two.sample", alternative="two.sided")
```

```
##
##      Two-sample t test power calculation
##
##               n = 51.03487
##               d = 0.56
##       sig.level = 0.05
##           power = 0.8
##     alternative = two.sided
##
## NOTE: n is number in *each* group
```

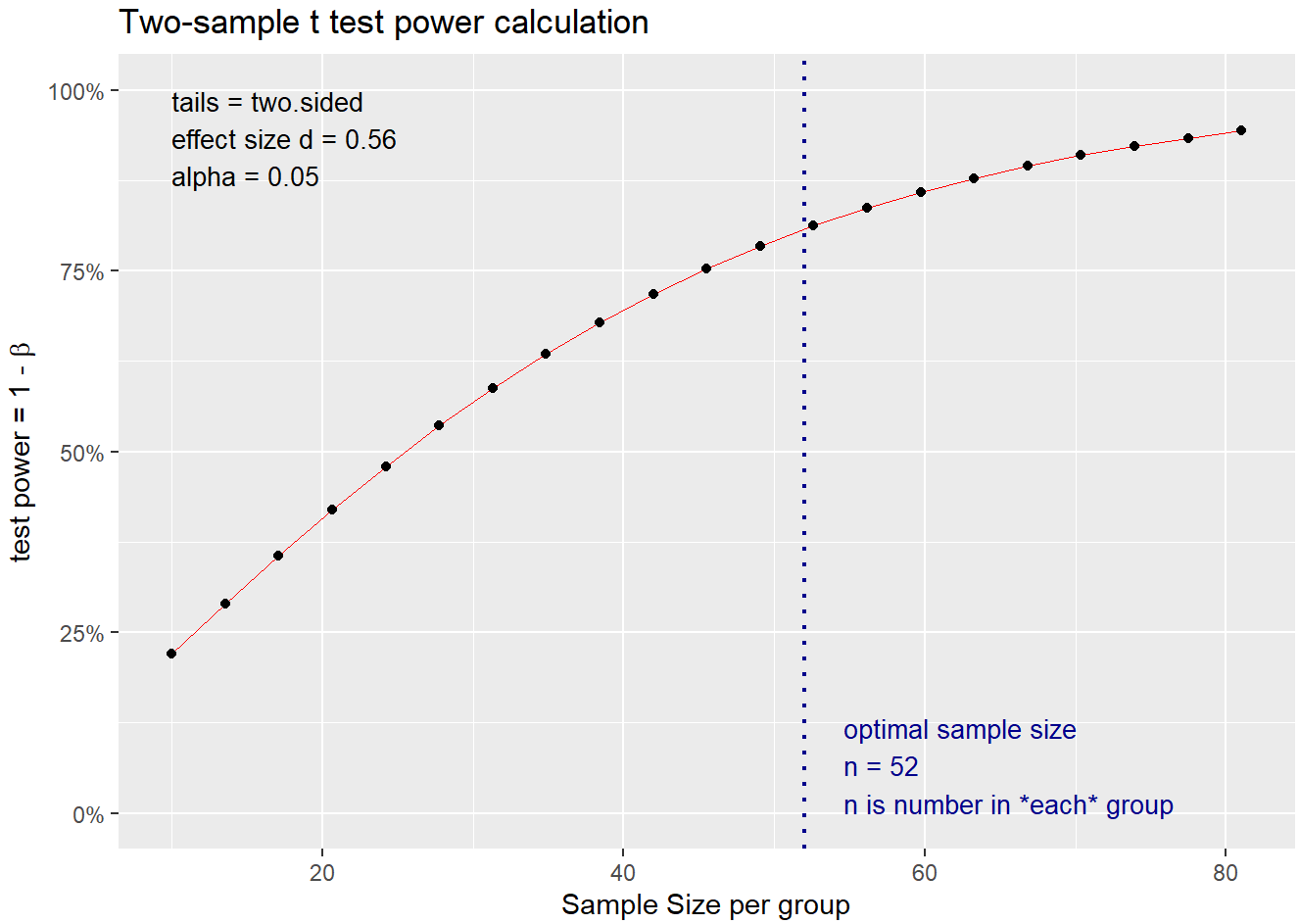
Let's plot the power curve

First, Assign results to an object

```
pow.1<-pwr.t.test(d=0.56, power=0.80, type="two.sample", alternative="two.sided")
```

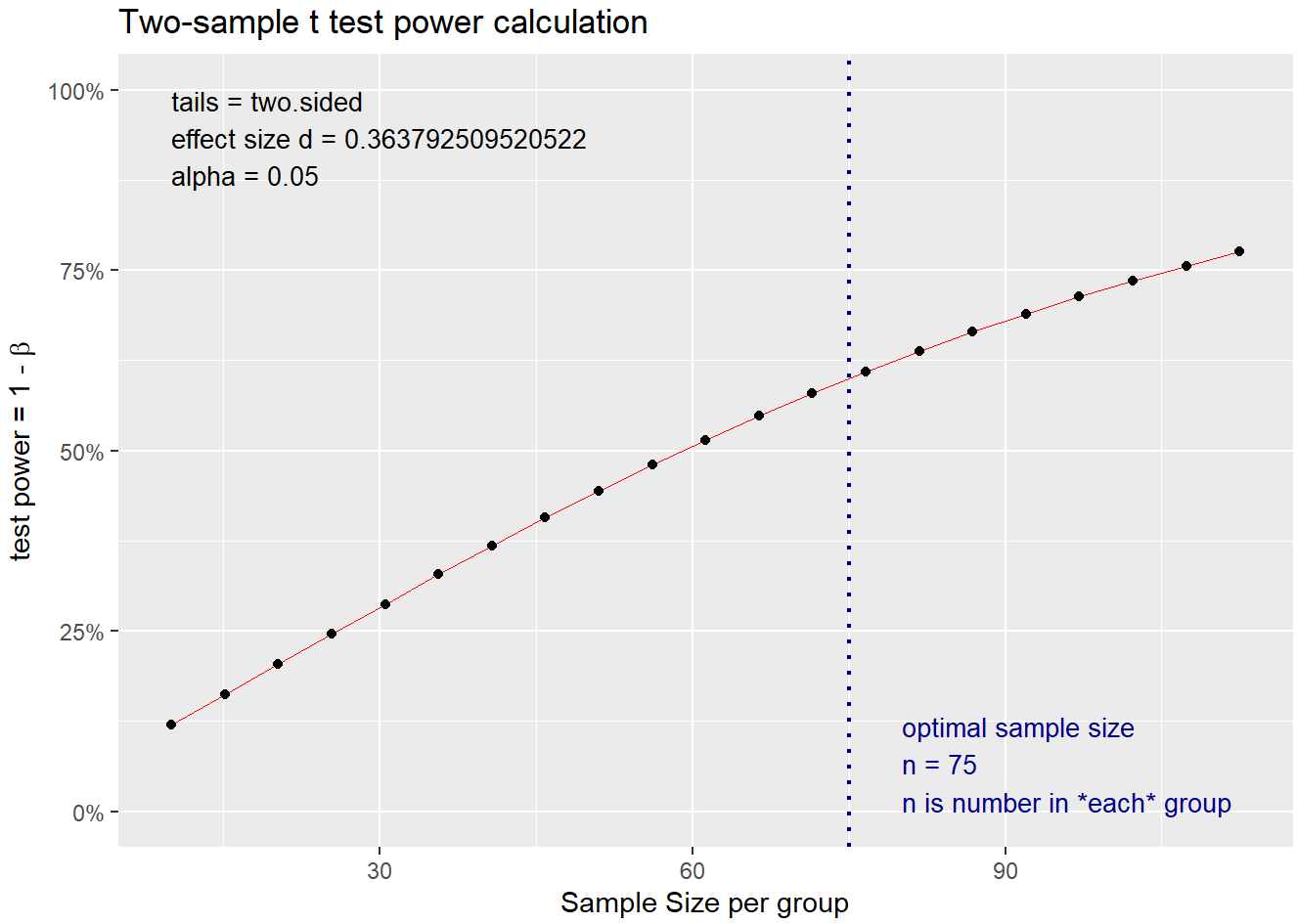
Now plot the results from object

```
plot(pow.1, xlab="Sample Size per group")
```



Conduct a power analysis to solve for EFFECT SIZE for an RCT ### Note, that we provide power, sample size, and now the Effect Size is estimated

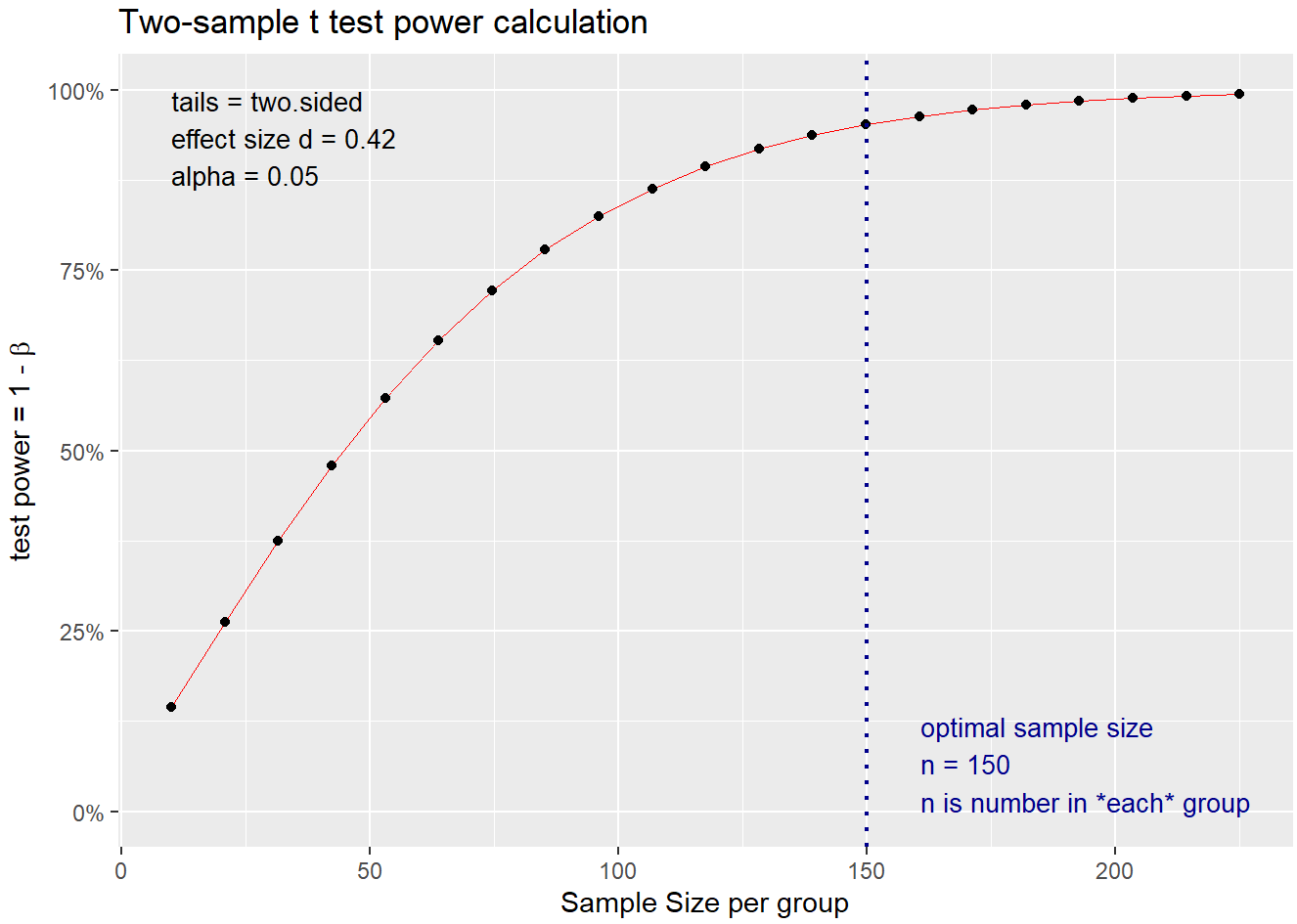
```
pow.2 <- pwr.t.test(power=0.60, n=75, type="two.sample", alternative="two.sided")
plot(pow.2, xlab="Sample Size per group")
```



Conduct a power analysis to solve for POWER for an RCT

Note, that we provide effect size, sample size, and now the POWER is estimated

```
pow.3 <- pwr.t.test(d = .42, n=150, type="two.sample", alternative="two.sided")
plot(pow.3, xlab="Sample Size per group")
```



Power analysis for 4 group Comparative Effectiveness one-way anova

Similarly, we estimate needed sample size for a given Effect Size and Power

```
pwr.anova.test(f=0.28,k=4,power =0.80, sig.level=0.05)
```

```
##
##      Balanced one-way analysis of variance power calculation
##
##               k = 4
##               n = 35.75789
##               f = 0.28
##       sig.level = 0.05
##           power = 0.8
##
## NOTE: n is number in each group
```

Now let's solve for Power given that we provide

sample size, groups, and effect size

```
pwr.anova.test(f=0.30,k=4,n=45, sig.level=0.05)
```

```
##
##      Balanced one-way analysis of variance power calculation
##
##               k = 4
##               n = 45
##               f = 0.3
##       sig.level = 0.05
##           power = 0.9316424
##
## NOTE: n is number in each group
```

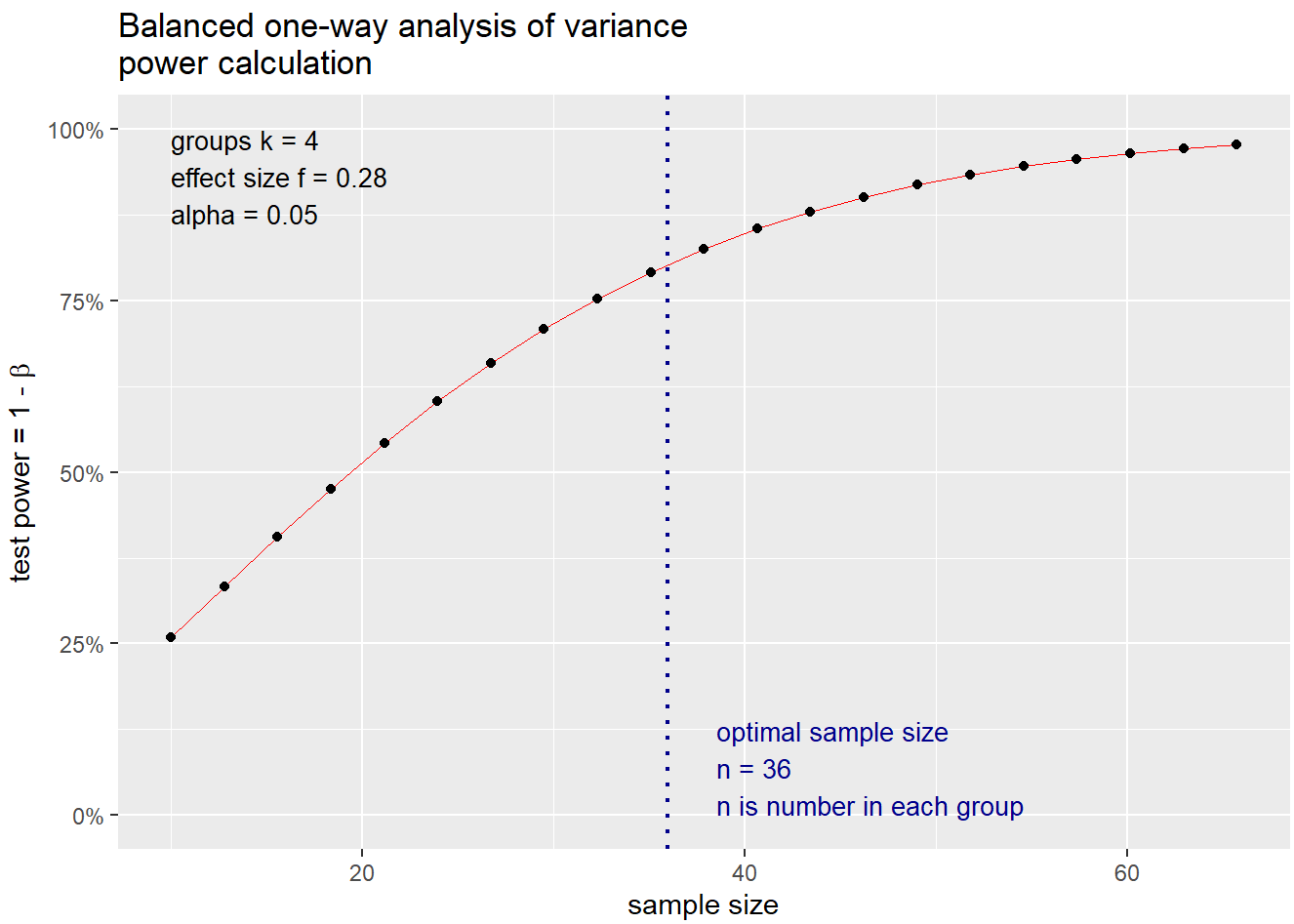
Now let's solve for Power given that we provide sample size, groups, and effect size

```
pwr.anova.test(power=.80,k=4,n=45, sig.level=0.05)
```

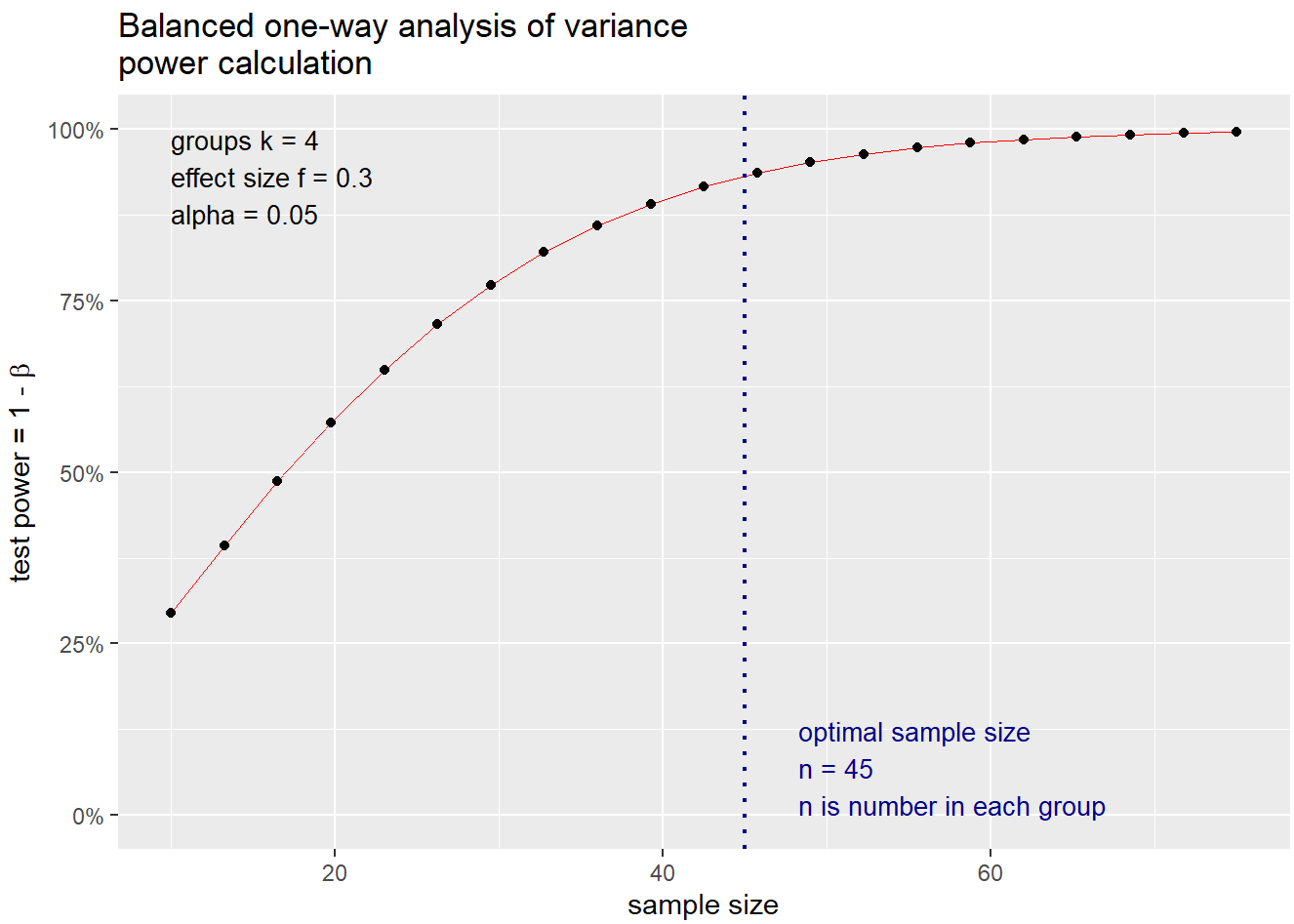
```
##
##      Balanced one-way analysis of variance power calculation
##
##               k = 4
##               n = 45
##               f = 0.2488586
##       sig.level = 0.05
##           power = 0.8
##
## NOTE: n is number in each group
```

Now let's plot our three respective power analyses

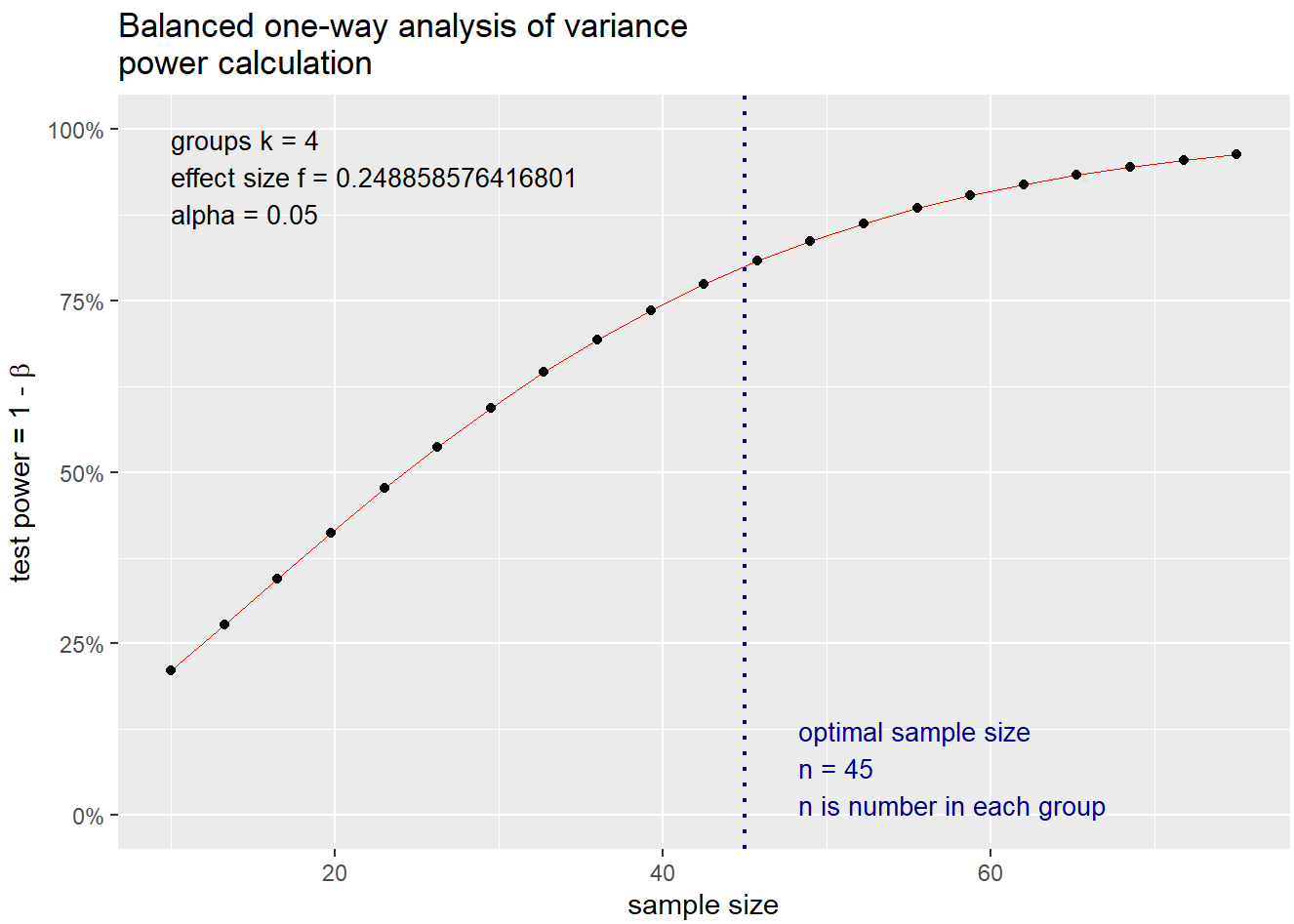
```
pow.4<-pwr.anova.test(f=0.28,k=4,power =0.80, sig.level=0.05)
plot(pow.4)
```




```
pow.5<-pwr.anova.test(f=0.30,k=4,n=45, sig.level=0.05)
plot(pow.5)
```




```
pow.6<-pwr.anova.test(power=.80,k=4,n=45, sig.level=0.05)
plot(pow.6)
```


Balanced one-way analysis of variance
power calculation
groups k = 4
effect size f = 0.248858576416801
alpha = 0.05
optimal sample size
n = 45
n is number in each group
test power = 1 - β
100%
75%
50%
25%
0%
20
40
60
sample size