Useful Calculations
Chapter 1

Total Rise

_____ Total distance from rough floor to rough floor

_____ + Thickness of upper finished floor

_____ - Thickness of lower finished floor

_____

_____ = Thickness rise (Finished floor to floor)

Number of Risers

_____ Total rise (Finished floor to floor)

_____ + Maximum unit rise

_____

_____ = Number of risers

(Rounded to the next highest whole number)

Unit Rise

_____ Total rise (Finished floor to floor)

_____ ÷ Number of risers

_____

_____ = Unit rise

Number of Treads

```
_____     Number of risers

_____     - One
_____

_____     = Number of treads
```

Minimum Total Run

```
_____     Number of treads

_____     (x) Maximum unit run
_____

_____     = Maximum total run
```

Unit Run

```
_____     Desired total run

_____     ÷ Number of treads
_____

_____     = Unit Run
```

Calculations
Chapter 2

Stringer Lengths - Pythagorean theorem

$$(Run)^2 + (Rise)^2 = (Rake)^2$$

$$(\underline{\hspace{1cm}})^2 + (\underline{\hspace{1cm}})^2 = (\underline{\hspace{1cm}})^2$$

$$(Rake)^2 = \underline{\hspace{1cm}}$$

$$(\quad)^2 = \underline{\hspace{1cm}}$$

$$\underline{\hspace{1cm}} \div 12'' = \underline{\hspace{1cm}}$$

- or the length of the stringer. Round this to the next highest "even" number. The rounded number will give you the necessary 2 x 12" length you will need.

Calculating First Riser Heights

_____ First unit rise

_____ - Tread thickness

_____ + Finished floor thickness

_____ = First Riser height

Checking the Fit of the Stringer

_____ Unit Rise Height

_____ + Tread thickness

_____ = Finished floor thickness

_____ = Distance of the stringer below rough cut

Calculations
Chapter 3

Starting Newel Height

_____   Distance from the bottom of the fitting to the tread

_____   + Desired rail height

_____   - Depth of the handrail
_____

_____   = Starting newel height

Newel Height

_____   Desired rail height

_____   - Rail thickness
_____

_____   = Newel height

Calculations
Chapter 4

Starting Newel Height

_____   Distance from the bottom of the fitting to the tread

_____   + Desired rail height

_____   - Depth of the handrail

_____

_____   = Starting newel height

Rake-to-Rake Newel Length

_____   Reveal

_____   + Rail Height

_____   + Slope difference

_____   + Tread height

_____

_____   = Rake-to-rake newel length (TOP MOUNT SYSTEM)

_____   + Tale or drop down length

_____   Rake-to-rake newel length (HALF LAP SYSTEM)

Rake-to-Balcony Newel Length

```
_____     Reveal

_____   + Rail Height

_____   + Tread height
_____

_____   = Newel Length (TOP MOUNT SYSTEM)

_____   + Tale or drop down length


_____     Newel length (HALF LAP SYSTEM)
```

Balcony Newel Length

```
_____     Reveal

_____   + Rail Height

_____   + Thickness of the finished floor
_____

_____   = Newel Length (TOP MOUNT SYSTEM)

_____   + Tale or drop down length


_____     Newel length (HALF LAP SYSTEM)
```

Calculations
Chapter 5

Baluster Spacing (Balcony or Landing)

_____   Distance

_____   ÷ Maximum baluster spacing + Thickness of narrowest part of baluster

_____

_____   Round to the nearest whole number

_____   = Minimum number of baluster spacing