

Another Algebraic Simplification Example

$$\mathbf{X.Y + X.Y.Z + X.Y./Z + /X.Y.Z}$$

1. We can deal with the terms in any order so bracket the 2nd and 3rd group to get

$$\mathbf{X.Y + (X.Y.Z + X.Y./Z) + /X.Y.Z}$$

2. Taking the bracketed group only remove the common term, in this case 'X.Y', to get

$$\mathbf{X.Y.(Z + /Z)}$$

3. The (Z + /Z) group = 1 so we get

$$\mathbf{X.Y.(1) \text{ which equals } X.Y}$$

4. Replacing the first group the complete expression is now

$$\mathbf{X.Y + X.Y + /X.Y.Z}$$

5. Combine the two left most terms:

$$\mathbf{X.(Y.Y) + /X.Y.Z}$$

6. Y.Y always = Y, so:

$$\mathbf{X.Y + /X.Y.Z}$$

7. Remove the common term:

$$\mathbf{Y. (X + /X.Z)}$$

8. The simplification theorem means that we can replace what is in the brackets with X + Z to give:

$$\mathbf{Y. (X + Z)}$$

Which is the simplified form of the original expression.