

```
(* Calculating the barbell return at 8 % *)  
(.293 * (8)) + (.707 * (8)) // N
```

8.

```
(Calculating the duration of a 30 year par bond at 8 % *)
```

```
((1.08) / (.08)) * (1 - (1 / ((1.08)^30))) // N
```

21.1139

```
(* Calculating the duration of a 15 year par bond at 8 %*)
```

```
((1.08) / (.08)) * (1 - (1 / ((1.08)^15))) // N
```

9.24424

```
(* Calculating the duration of a a 5 year par bond at 8 % *)
```

```
((1.08) / (.08)) * (1 - (1 / ((1.08)^5))) // N
```

4.31213

```
(* Verifying that the weights for the 15 vs 5 + 30 has a zero duration *)
```

```
9.24424 - (.293 * (21.1139)) - (.707 * (4.31)) // N
```

0.0106973