EIGENVALUES of CHAIN MATRIX again, via

Shifted $A_k - s_k I = Q_k R_k$, $A_{k+1} = R_k Q_k + s_k I$ iterations

$A_0 =$

```
 9.0000 -4.0000    .       .       .
-4.0000  7.0000 -3.0000    .       .
   .    -3.0000  5.0000 -2.0000    .
   .       .    -2.0000  3.0000 -1.0000
   .       .       .     -1.0000  1.0000
```

$s_0 = 0.585786$ yields $A_1 =$

```
11.7334 -2.1728    .       .       .
-2.1728  7.1114 -1.6554    .       .
   .    -1.6554  4.1987 -0.8110    .
   .       .    -0.8110  1.5687 -0.3727
   .       .       .     -0.3727  0.3878
```

$s_1 = 0.280042$ yields $A_2 =$

```
12.3686 -1.2153    .       .       .
-1.2153  7.1282 -0.8818    .       .
   .    -0.8818  3.7951 -0.2645    .
   .       .    -0.2645  1.4446 -0.0057
   .       .       .     -0.0057  0.2636
```

$s_2 = 0.263561$ yields $A_3 =$

```
12.5578 -0.6759    .       .       .
-0.6759  7.1122 -0.4428    .       .
   .    -0.4428  3.6493 -0.0901    .
   .       .    -0.0901  1.4171    .
   .       .       .       .      0.263560319718
```

$s_3 = 1.413460$ yields $A_4 =$

```
12.6196 -0.3429    .       .       .
-0.3429  7.0986 -0.1717    .       .
   .    -0.1717  3.6049  0.0000    .
   .       .     0.0000  1.4134    .
   .       .       .       .      0.263560319718
```

$s_4 = 1.413403$ yields $A_5 =$

```
12.6354 -0.1736    .       .       .
-0.1736  7.0900 -0.0661    .       .
   .    -0.0661  3.5977    .       .
   .       .       .     1.413403059107
   .       .       .       .      0.263560319718
```

$s_5 = 3.596427$ yields $A_6 =$

```
12.6400 -0.0670    .       .       .
-0.0670  7.0866    .       .       .
   .       .    3.596425771041    .
   .       .       .     1.413403059107
   .       .       .       .      0.263560319718
```

$s_6 = 7.085810$ yields $A_7 =$

```
12.640800844276    .       .       .
   .    7.085810005859    .       .
   .       .    3.596425771041    .
   .       .       .     1.413403059107
   .       .       .       .      0.263560319718
```

By contrast, via the **UNshifted** $A_k = Q_k R_k$, $A_{k+1} = R_k Q_k$ route:

Start with matrix A_0 =

9.0000	-4.0000	.	.	.	
-4.0000	7.0000	-3.0000	.	.	
.	-3.0000	5.0000	-2.0000	.	
.	.	-2.0000	3.0000	-1.0000	
.	.	.	-1.0000	1.0000	again

Then R_0Q_0 yields A_1 =

11.6392	-2.2893	.	.	.
-2.2893	7.0123	-1.8201	.	.
.	-1.8201	4.1778	-1.0269	.
.	.	-1.0269	1.8748	-0.2050
.	.	.	-0.2050	0.2959

R_1Q_1 yields A_2 =

12.3339	-1.2913	.	.	.
-1.2913	7.0943	-1.0012	.	.
.	-1.0012	3.8118	-0.4292	.
.	.	-0.4292	1.4954	-0.0356
.	.	.	-0.0356	0.2646

R_2Q_2 yields A_3 =

12.5445	-0.7282	.	.	.
-0.7282	7.1028	-0.5233	.	.
.	-0.5233	3.6628	-0.1686	.
.	.	-0.1686	1.4263	-0.0065
.	.	.	-0.0065	0.2636

R_3Q_3 yields A_4 =

12.6105	-0.4096	.	.	.
-0.4096	7.0955	-0.2679	.	.
.	-0.2679	3.6150	-0.0660	.
.	.	-0.0660	1.4154	-0.0012
.	.	.	-0.0012	0.2636

R_4Q_4 yields A_5 =

12.6313	-0.2300	.	.	.
-0.2300	7.0900	-0.1362	.	.
.	-0.1362	3.6014	-0.0259	.
.	.	-0.0259	1.4137	-0.0002
.	.	.	-0.0002	0.2636

... R_8Q_8 yields A_9 =

12.6407	-0.0227	.	.	.
-0.0227	7.0859	-0.0090	.	.
.	-0.0090	3.5964	-0.0006	.
.	.	-0.0006	1.4134	.
.	.	.	.	**0.263560319718**

... $R_{15}Q_{15}$ yields A_{16} =

12.6408	-0.0004	.	.	.
-0.0004	7.0858	-0.0001	.	.
.	-0.0001	3.5964	.	.
.	.	.	**1.413403059107**	
.	.	.	.	**0.263560319718**

... $R_{21}Q_{21}$ yields A_{22} =

12.6408	0.0000	.	.	.
0.0000	7.0858	.	.	.
.	.	**3.596425771041**	.	
.	.	.	**1.413403059107**	
.	.	.	.	**0.263560319718**

... $R_{25}Q_{25}$ yields A_{26} =

12.640800844276	.	.	.	
.	**7.085810005859**	.	.	
.	.	**3.596425771041**	.	
.	.	.	**1.413403059107**	
.	.	.	.	**0.263560319718**