```
f[0] = f[1] = 1;
f[n_] := f[n] = f[n - 1] + f[n - 2];
```

```
f[10]
```

89

```
f[20]
```

10 946

```
f[30]
```

1 346 269

```
f[40]
```

165 580 141

```
f[100]
```

573 147 844 013 817 084 101

```
f_{1,0,k_}[{e_}] := 1/e; f_{0,1,k_}[{e_}] := (-1)^(k+1)/e;
f_{-1,_,_}[_] = 0; f_{_,-1,_}[_] = 0;
f_{a_,b_,k_}[e_List] := f_{a,b,k}[e] = Factor[1/Total[e] Plus[
      Sum[(-1)^(j+1) f_{a-1,b,k-1}[Delete[e, j]], {j, 1, k}],
      Sum[(-1)^(j+1) f_{a-1,b,k}[Delete[e, j]], {j, k + 1, a + b}],
      Sum[(-1)^(j+a+b) f_{a,b-1,k-1}[Delete[e, j]], {j, 1, k}],
      Sum[(-1)^(j+a+b+1) f_{a,b-1,k}[Delete[e, j]], {j, k + 1, a + b}]
     ]];
f_{a_,b_,k_}[e__] := f_{a,b,k}[{e}];
g_{a_,b_}[s_] := f_{a,b,If[EvenQ[a+b], (a+b)/2, (a+b+1)/2]}[s + Range[a + b]];
```

```
f_{1,1,1}[e1, e2]
```

$$-\frac{2}{e1\ e2}$$

```
f_{2,2,2}[e1, e2, e3, e4]
```

$$-\left(\left(2\ (e1-e2)\ (e3-e4)\right.\right.$$
$$\left(e1^2\ e2^2+3\ e1^2\ e2\ e3+3\ e1\ e2^2\ e3+e1\ e2\ e3^2+3\ e1^2\ e2\ e4+3\ e1\ e2^2\ e4+e1^2\ e3\ e4+2\ e1\ e2\ e3\ e4+\right.$$
$$\left.\left.e2^2\ e3\ e4+3\ e1\ e3^2\ e4+3\ e2\ e3^2\ e4+e1\ e2\ e4^2+3\ e1\ e3\ e4^2+3\ e2\ e3\ e4^2+e3^2\ e4^2\right)\right)/$$
$$\left.\left(e1\ e2\ (e1+e2)\ e3\ (e1+e3)\ (e2+e3)\ e4\ (e1+e4)\ (e2+e4)\ (e3+e4)\right)\right)$$

```
f_{4,0,2}[e1, e2, e3, e4]
```

$$\left((e1-e2)\ (e1-e3)\ (e2-e3)\ (e1-e4)\ (e2-e4)\ (e3-e4)\right)/$$
$$\left(e1\ e2\ (e1+e2)\ e3\ (e1+e3)\ (e2+e3)\ e4\ (e1+e4)\ (e2+e4)\ (e3+e4)\right)$$

```
f_{6,0,2}[e1, e2, e3, e4, e5, e6]
```

$$\left((e1-e2)\,(e1-e3)\,(e2-e3)\,(e1-e4)\,(e2-e4)\,(e3-e4)\,(e1-e5)\,(e2-e5)\,(e3-e5)\,(e4-e5)\,(e1-e6)\,(e2-e6)\,(e3-e6)\,(e4-e6)\,(e5-e6)\right)\Big/\left(e1\,e2\,(e1+e2)\,e3\,(e1+e3)\,(e2+e3)\,e4\,(e1+e4)\,(e2+e4)\,(e3+e4)\,e5\,(e1+e5)\,(e2+e5)\,(e3+e5)\,(e4+e5)\,e6\,(e1+e6)\,(e2+e6)\,(e3+e6)\,(e4+e6)\,(e5+e6)\right)$$

```
g_{2,0}[s] // Factor
```

$$-\frac{1}{(1+s)\,(2+s)\,(3+2s)}$$

```
Table[g_{2-j,j}[s], {j, 0, 2}] // Simplify
```

$$\left\{-\frac{1}{6+13s+9s^2+2s^3},\ -\frac{2}{2+3s+s^2},\ -\frac{1}{6+13s+9s^2+2s^3}\right\}$$

```
Sum[g_{4-j,j}[s], {j, 0, 4}] // Simplify
```

$$-\frac{4}{(1+s)\,(2+s)^2\,(3+s)\,(5+2s)^2}$$

```
{f_{2,0,1}[e1, e2], f_{1,1,1}[e1, e2], f_{0,2,1}[e1, e2]} // Factor
```

$$\left\{\frac{e1-e2}{e1\,e2\,(e1+e2)},\ -\frac{2}{e1\,e2},\ \frac{e1-e2}{e1\,e2\,(e1+e2)}\right\}$$

```
g_{2,2}[s] // Factor
```

$$-\left(\left(2\,(11+10s+2s^2)\,(27+20s+4s^2)\right)\Big/\left((1+s)\,(2+s)^2\,(3+s)^2\,(4+s)\,(3+2s)\,(5+2s)^2\,(7+2s)\right)\right)$$

```
Roots[(11 + 10 s + 2 s^2) (27 + 20 s + 4 s^2) == 0, s]
```

$$s==\frac{1}{2}\left(-5-\sqrt{3}\right)\ ||\ s==\frac{1}{2}\left(-5+\sqrt{3}\right)\ ||\ s==\frac{1}{2}\left(-5-i\sqrt{2}\right)\ ||\ s==\frac{1}{2}\left(-5+i\sqrt{2}\right)$$

```
g_{3,3}[s]
```

$$\left(8\,(6498+11\,886s+8803s^2+3402s^3+733s^4+84s^5+4s^6)\right)\Big/\left((1+s)\,(2+s)^2\,(3+s)^3\,(4+s)^3\,(5+s)^2\,(6+s)\,(3+2s)\,(5+2s)\,(7+2s)^2\,(9+2s)\,(11+2s)\right)$$

```
g_{4,4}[s]
```

$$\left(144\,(4\,372\,404\,765\,750+16\,848\,330\,326\,100s+30\,226\,607\,375\,760s^2+33\,485\,975\,037\,198s^3+25\,627\,514\,400\,759s^4+14\,365\,596\,714\,390s^5+6\,102\,539\,665\,580s^6+2\,004\,987\,787\,236s^7+515\,257\,013\,513s^8+104\,006\,124\,720s^9+16\,449\,977\,360s^{10}+2\,019\,000\,384s^{11}+188\,661\,472s^{12}+12\,983\,040s^{13}+620\,800s^{14}+18\,432s^{15}+256s^{16})\right)\Big/\left((1+s)\,(2+s)^2\,(3+s)^3\,(4+s)^4\,(5+s)^4\,(6+s)^3\,(7+s)^2\,(8+s)\,(3+2s)\,(5+2s)^2\,(7+2s)^3\,(9+2s)^4\,(11+2s)^3\,(13+2s)^2\,(15+2s)\right)$$

```
g5,5[s]
```

$$-\Big(\big(10\,368\,\big(80\,959\,559\,679\,180\,000+317\,466\,561\,988\,422\,000\,s+591\,592\,563\,497\,170\,800\,s^2+695\,441\,699\,816\,220\,720\,s^3+577\,440\,929\,968\,994\,286\,s^4+359\,447\,959\,310\,152\,350\,s^5+173\,834\,632\,743\,961\,735\,s^6+66\,820\,854\,214\,489\,430\,s^7+20\,723\,204\,742\,629\,761\,s^8+5\,235\,404\,373\,851\,850\,s^9+1\,083\,486\,544\,761\,945\,s^{10}+184\,088\,304\,487\,890\,s^{11}+25\,649\,872\,746\,001\,s^{12}+2\,917\,336\,994\,000\,s^{13}+268\,444\,616\,080\,s^{14}+19\,694\,188\,800\,s^{15}+1\,125\,849\,696\,s^{16}+48\,364\,800\,s^{17}+1\,469\,440\,s^{18}+28\,160\,s^{19}+256\,s^{20}\big)\big)\Big/\Big((1+s)\,(2+s)^2\,(3+s)^3\,(4+s)^4\,(5+s)^5\,(6+s)^5\,(7+s)^4\,(8+s)^3\,(9+s)^2\,(10+s)\,(3+2s)\,(5+2s)^2\,(7+2s)^2\,(9+2s)^3\,(11+2s)^4\,(13+2s)^3\,(15+2s)^2\,(17+2s)^2\,(19+2s)\Big)\Big)$$

```
Solve[g4,4[s] == 0, s]
```

$$\Big\{\Big\{s\to\frac{1}{2}\,\Big(-9-\sqrt{\big(81+4\,\text{Root}\big[4\,372\,404\,765\,750+1\,872\,036\,702\,900\,\#1+350\,056\,428\,060\,\#1^2+37\,290\,753\,542\,\#1^3+2\,471\,544\,713\,\#1^4+104\,179\,952\,\#1^5+2\,721\,760\,\#1^6+40\,192\,\#1^7+256\,\#1^8\,\&,\,1\big]\big)}\Big)\Big\},$$

$$\Big\{s\to\frac{1}{2}\,\Big(-9+\sqrt{\big(81+4\,\text{Root}\big[4\,372\,404\,765\,750+1\,872\,036\,702\,900\,\#1+350\,056\,428\,060\,\#1^2+37\,290\,753\,542\,\#1^3+2\,471\,544\,713\,\#1^4+104\,179\,952\,\#1^5+2\,721\,760\,\#1^6+40\,192\,\#1^7+256\,\#1^8\,\&,\,1\big]\big)}\Big)\Big\},\ \Big\{s\to\frac{1}{2}\,\Big(-9-\sqrt{\big(81+4\,\text{Root}\big[4\,372\,404\,765\,750+1\,872\,036\,702\,900\,\#1+350\,056\,428\,060\,\#1^2+37\,290\,753\,542\,\#1^3+2\,471\,544\,713\,\#1^4+104\,179\,952\,\#1^5+2\,721\,760\,\#1^6+40\,192\,\#1^7+256\,\#1^8\,\&,\,2\big]\big)}\Big)\Big\},$$

$$\Big\{s\to\frac{1}{2}\,\Big(-9+\sqrt{\big(81+4\,\text{Root}\big[4\,372\,404\,765\,750+1\,872\,036\,702\,900\,\#1+350\,056\,428\,060\,\#1^2+37\,290\,753\,542\,\#1^3+2\,471\,544\,713\,\#1^4+104\,179\,952\,\#1^5+2\,721\,760\,\#1^6+40\,192\,\#1^7+256\,\#1^8\,\&,\,2\big]\big)}\Big)\Big\},$$

$$\Big\{s\to\frac{1}{2}\,\Big(-9-\sqrt{\big(81+4\,\text{Root}\big[4\,372\,404\,765\,750+1\,872\,036\,702\,900\,\#1+350\,056\,428\,060\,\#1^2+37\,290\,753\,542\,\#1^3+2\,471\,544\,713\,\#1^4+104\,179\,952\,\#1^5+2\,721\,760\,\#1^6+40\,192\,\#1^7+256\,\#1^8\,\&,\,3\big]\big)}\Big)\Big\},$$

$$\Big\{s\to\frac{1}{2}\,\Big(-9+\sqrt{\big(81+4\,\text{Root}\big[4\,372\,404\,765\,750+1\,872\,036\,702\,900\,\#1+350\,056\,428\,060\,\#1^2+37\,290\,753\,542\,\#1^3+2\,471\,544\,713\,\#1^4+104\,179\,952\,\#1^5+2\,721\,760\,\#1^6+40\,192\,\#1^7+256\,\#1^8\,\&,\,3\big]\big)}\Big)\Big\},$$

$$\Big\{s\to\frac{1}{2}\,\Big(-9-\sqrt{\big(81+4\,\text{Root}\big[4\,372\,404\,765\,750+1\,872\,036\,702\,900\,\#1+350\,056\,428\,060\,\#1^2+37\,290\,753\,542\,\#1^3+2\,471\,544\,713\,\#1^4+104\,179\,952\,\#1^5+2\,721\,760\,\#1^6+40\,192\,\#1^7+256\,\#1^8\,\&,\,4\big]\big)}\Big)\Big\},$$

$$\Big\{s\to\frac{1}{2}\,\Big(-9+\sqrt{\big(81+4\,\text{Root}\big[4\,372\,404\,765\,750+1\,872\,036\,702\,900\,\#1+350\,056\,428\,060\,\#1^2+37\,290\,753\,542\,\#1^3+2\,471\,544\,713\,\#1^4+104\,179\,952\,\#1^5+2\,721\,760\,\#1^6+40\,192\,\#1^7+256\,\#1^8\,\&,\,4\big]\big)}\Big)\Big\},$$

$$\Big\{s\to\frac{1}{2}\,\Big(-9-\sqrt{\big(81+4\,\text{Root}\big[4\,372\,404\,765\,750+1\,872\,036\,702\,900\,\#1+350\,056\,428\,060\,\#1^2+37\,290\,753\,542\,\#1^3+2\,471\,544\,713\,\#1^4+104\,179\,952\,\#1^5+2\,721\,760\,\#1^6+40\,192\,\#1^7+256\,\#1^8\,\&,\,5\big]\big)}\Big)\Big\},$$

$$\Big\{s\to\frac{1}{2}\,\Big(-9+\sqrt{\big(81+4\,\text{Root}\big[4\,372\,404\,765\,750+1\,872\,036\,702\,900\,\#1+350\,056\,428\,060\,\#1^2+37\,290\,753\,542\,\#1^3+2\,471\,544\,713\,\#1^4+104\,179\,952\,\#1^5+2\,721\,760\,\#1^6+40\,192\,\#1^7+256\,\#1^8\,\&,\,5\big]\big)}\Big)\Big\},$$

$$\Big\{s\to\frac{1}{2}\,\Big(-9-\sqrt{\big(81+4\,\text{Root}\big[4\,372\,404\,765\,750+1\,872\,036\,702\,900\,\#1+350\,056\,428\,060\,\#1^2+$$

```
-
        37 290 753 542 #1^3 + 2 471 544 713 #1^4 + 104 179 952 #1^5 +
        2 721 760 #1^6 + 40 192 #1^7 + 256 #1^8 &, 6]))},
 {s → 1/2 (-9 + Sqrt[81 + 4 Root[4 372 404 765 750 + 1 872 036 702 900 #1 + 350 056 428 060 #1^2 +
        37 290 753 542 #1^3 + 2 471 544 713 #1^4 + 104 179 952 #1^5 +
        2 721 760 #1^6 + 40 192 #1^7 + 256 #1^8 &, 6]])},
 {s → 1/2 (-9 - Sqrt[81 + 4 Root[4 372 404 765 750 + 1 872 036 702 900 #1 + 350 056 428 060 #1^2 +
        37 290 753 542 #1^3 + 2 471 544 713 #1^4 + 104 179 952 #1^5 +
        2 721 760 #1^6 + 40 192 #1^7 + 256 #1^8 &, 7]])},
 {s → 1/2 (-9 + Sqrt[81 + 4 Root[4 372 404 765 750 + 1 872 036 702 900 #1 + 350 056 428 060 #1^2 +
        37 290 753 542 #1^3 + 2 471 544 713 #1^4 + 104 179 952 #1^5 +
        2 721 760 #1^6 + 40 192 #1^7 + 256 #1^8 &, 7]])},
 {s → 1/2 (-9 - Sqrt[81 + 4 Root[4 372 404 765 750 + 1 872 036 702 900 #1 + 350 056 428 060 #1^2 +
        37 290 753 542 #1^3 + 2 471 544 713 #1^4 + 104 179 952 #1^5 +
        2 721 760 #1^6 + 40 192 #1^7 + 256 #1^8 &, 8]])},
 {s → 1/2 (-9 + Sqrt[81 + 4 Root[4 372 404 765 750 + 1 872 036 702 900 #1 + 350 056 428 060 #1^2 +
        37 290 753 542 #1^3 + 2 471 544 713 #1^4 + 104 179 952 #1^5 +
        2 721 760 #1^6 + 40 192 #1^7 + 256 #1^8 &, 8]])}}
```

```
Solve[g5,5[s] == 0, s]
```

```
{{s → 1/2 (-11 -
      Sqrt[121 + 4 Root[80 959 559 679 180 000 + 28 860 596 544 402 000 #1 + 4 650 677 412 832 800 #1^2 +
        445 624 941 197 520 #1^3 + 28 073 792 698 686 #1^4 + 1 212 519 412 626 #1^5 +
        36 264 599 809 #1^6 + 739 166 992 #1^7 + 9 784 416 #1^8 + 75 520 #1^9 + 256 #1^10 &, 1]])},
 {s → 1/2 (-11 + Sqrt[121 + 4 Root[80 959 559 679 180 000 + 28 860 596 544 402 000 #1 + 4 650 677 412 832 800
        #1^2 + 445 624 941 197 520 #1^3 + 28 073 792 698 686 #1^4 + 1 212 519 412 626 #1^5 +
        36 264 599 809 #1^6 + 739 166 992 #1^7 + 9 784 416 #1^8 + 75 520 #1^9 + 256 #1^10 &, 1]])},
 {s → 1/2 (-11 - Sqrt[121 + 4 Root[80 959 559 679 180 000 + 28 860 596 544 402 000 #1 + 4 650 677 412 832 800
        #1^2 + 445 624 941 197 520 #1^3 + 28 073 792 698 686 #1^4 + 1 212 519 412 626 #1^5 +
        36 264 599 809 #1^6 + 739 166 992 #1^7 + 9 784 416 #1^8 + 75 520 #1^9 + 256 #1^10 &, 2]])},
 {s → 1/2 (-11 + Sqrt[121 + 4 Root[80 959 559 679 180 000 + 28 860 596 544 402 000 #1 + 4 650 677 412 832 800
        #1^2 + 445 624 941 197 520 #1^3 + 28 073 792 698 686 #1^4 + 1 212 519 412 626 #1^5 +
        36 264 599 809 #1^6 + 739 166 992 #1^7 + 9 784 416 #1^8 + 75 520 #1^9 + 256 #1^10 &, 2]])},
 {s → 1/2 (-11 - Sqrt[121 + 4 Root[80 959 559 679 180 000 + 28 860 596 544 402 000 #1 + 4 650 677 412 832 800
        #1^2 + 445 624 941 197 520 #1^3 + 28 073 792 698 686 #1^4 + 1 212 519 412 626 #1^5 +
        36 264 599 809 #1^6 + 739 166 992 #1^7 + 9 784 416 #1^8 + 75 520 #1^9 + 256 #1^10 &, 3]])},
 {s → 1/2 (-11 + Sqrt[121 + 4 Root[80 959 559 679 180 000 + 28 860 596 544 402 000 #1 + 4 650 677 412 832 800
        #1^2 + 445 624 941 197 520 #1^3 + 28 073 792 698 686 #1^4 + 1 212 519 412 626 #1^5 +
        36 264 599 809 #1^6 + 739 166 992 #1^7 + 9 784 416 #1^8 + 75 520 #1^9 + 256 #1^10 &, 3]])},
 {s → 1/2 (-11 - Sqrt[121 + 4 Root[80 959 559 679 180 000 + 28 860 596 544 402 000 #1 + 4 650 677 412 832 800
        #1^2 + 445 624 941 197 520 #1^3 + 28 073 792 698 686 #1^4 + 1 212 519 412 626 #1^5 +
        36 264 599 809 #1^6 + 739 166 992 #1^7 + 9 784 416 #1^8 + 75 520 #1^9 + 256 #1^10 &, 4]])},
```

$$\left\{s \to \frac{1}{2}\left(-11+\sqrt{\left(121+4\,\text{Root}\left[80\,959\,559\,679\,180\,000+28\,860\,596\,544\,402\,000\,\#1+4\,650\,677\,412\,832\,800\,\#1^2+445\,624\,941\,197\,520\,\#1^3+28\,073\,792\,698\,686\,\#1^4+1\,212\,519\,412\,626\,\#1^5+36\,264\,599\,809\,\#1^6+739\,166\,992\,\#1^7+9\,784\,416\,\#1^8+75\,520\,\#1^9+256\,\#1^{10}\&,4\right]\right)}\right)\right\},$$

$$\left\{s \to \frac{1}{2}\left(-11-\sqrt{\left(121+4\,\text{Root}\left[80\,959\,559\,679\,180\,000+28\,860\,596\,544\,402\,000\,\#1+4\,650\,677\,412\,832\,800\,\#1^2+445\,624\,941\,197\,520\,\#1^3+28\,073\,792\,698\,686\,\#1^4+1\,212\,519\,412\,626\,\#1^5+36\,264\,599\,809\,\#1^6+739\,166\,992\,\#1^7+9\,784\,416\,\#1^8+75\,520\,\#1^9+256\,\#1^{10}\&,5\right]\right)}\right)\right\},$$

$$\left\{s \to \frac{1}{2}\left(-11+\sqrt{\left(121+4\,\text{Root}\left[80\,959\,559\,679\,180\,000+28\,860\,596\,544\,402\,000\,\#1+4\,650\,677\,412\,832\,800\,\#1^2+445\,624\,941\,197\,520\,\#1^3+28\,073\,792\,698\,686\,\#1^4+1\,212\,519\,412\,626\,\#1^5+36\,264\,599\,809\,\#1^6+739\,166\,992\,\#1^7+9\,784\,416\,\#1^8+75\,520\,\#1^9+256\,\#1^{10}\&,5\right]\right)}\right)\right\},$$

$$\left\{s \to \frac{1}{2}\left(-11-\sqrt{\left(121+4\,\text{Root}\left[80\,959\,559\,679\,180\,000+28\,860\,596\,544\,402\,000\,\#1+4\,650\,677\,412\,832\,800\,\#1^2+445\,624\,941\,197\,520\,\#1^3+28\,073\,792\,698\,686\,\#1^4+1\,212\,519\,412\,626\,\#1^5+36\,264\,599\,809\,\#1^6+739\,166\,992\,\#1^7+9\,784\,416\,\#1^8+75\,520\,\#1^9+256\,\#1^{10}\&,6\right]\right)}\right)\right\},$$

$$\left\{s \to \frac{1}{2}\left(-11+\sqrt{\left(121+4\,\text{Root}\left[80\,959\,559\,679\,180\,000+28\,860\,596\,544\,402\,000\,\#1+4\,650\,677\,412\,832\,800\,\#1^2+445\,624\,941\,197\,520\,\#1^3+28\,073\,792\,698\,686\,\#1^4+1\,212\,519\,412\,626\,\#1^5+36\,264\,599\,809\,\#1^6+739\,166\,992\,\#1^7+9\,784\,416\,\#1^8+75\,520\,\#1^9+256\,\#1^{10}\&,6\right]\right)}\right)\right\},$$

$$\left\{s \to \frac{1}{2}\left(-11-\sqrt{\left(121+4\,\text{Root}\left[80\,959\,559\,679\,180\,000+28\,860\,596\,544\,402\,000\,\#1+4\,650\,677\,412\,832\,800\,\#1^2+445\,624\,941\,197\,520\,\#1^3+28\,073\,792\,698\,686\,\#1^4+1\,212\,519\,412\,626\,\#1^5+36\,264\,599\,809\,\#1^6+739\,166\,992\,\#1^7+9\,784\,416\,\#1^8+75\,520\,\#1^9+256\,\#1^{10}\&,7\right]\right)}\right)\right\},$$

$$\left\{s \to \frac{1}{2}\left(-11+\sqrt{\left(121+4\,\text{Root}\left[80\,959\,559\,679\,180\,000+28\,860\,596\,544\,402\,000\,\#1+4\,650\,677\,412\,832\,800\,\#1^2+445\,624\,941\,197\,520\,\#1^3+28\,073\,792\,698\,686\,\#1^4+1\,212\,519\,412\,626\,\#1^5+36\,264\,599\,809\,\#1^6+739\,166\,992\,\#1^7+9\,784\,416\,\#1^8+75\,520\,\#1^9+256\,\#1^{10}\&,7\right]\right)}\right)\right\},$$

$$\left\{s \to \frac{1}{2}\left(-11-\sqrt{\left(121+4\,\text{Root}\left[80\,959\,559\,679\,180\,000+28\,860\,596\,544\,402\,000\,\#1+4\,650\,677\,412\,832\,800\,\#1^2+445\,624\,941\,197\,520\,\#1^3+28\,073\,792\,698\,686\,\#1^4+1\,212\,519\,412\,626\,\#1^5+36\,264\,599\,809\,\#1^6+739\,166\,992\,\#1^7+9\,784\,416\,\#1^8+75\,520\,\#1^9+256\,\#1^{10}\&,8\right]\right)}\right)\right\},$$

$$\left\{s \to \frac{1}{2}\left(-11+\sqrt{\left(121+4\,\text{Root}\left[80\,959\,559\,679\,180\,000+28\,860\,596\,544\,402\,000\,\#1+4\,650\,677\,412\,832\,800\,\#1^2+445\,624\,941\,197\,520\,\#1^3+28\,073\,792\,698\,686\,\#1^4+1\,212\,519\,412\,626\,\#1^5+36\,264\,599\,809\,\#1^6+739\,166\,992\,\#1^7+9\,784\,416\,\#1^8+75\,520\,\#1^9+256\,\#1^{10}\&,8\right]\right)}\right)\right\},$$

$$\left\{s \to \frac{1}{2}\left(-11-\sqrt{\left(121+4\,\text{Root}\left[80\,959\,559\,679\,180\,000+28\,860\,596\,544\,402\,000\,\#1+4\,650\,677\,412\,832\,800\,\#1^2+445\,624\,941\,197\,520\,\#1^3+28\,073\,792\,698\,686\,\#1^4+1\,212\,519\,412\,626\,\#1^5+36\,264\,599\,809\,\#1^6+739\,166\,992\,\#1^7+9\,784\,416\,\#1^8+75\,520\,\#1^9+256\,\#1^{10}\&,9\right]\right)}\right)\right\},$$

$$\left\{s \to \frac{1}{2}\left(-11+\sqrt{\left(121+4\,\text{Root}\left[80\,959\,559\,679\,180\,000+28\,860\,596\,544\,402\,000\,\#1+4\,650\,677\,412\,832\,800\,\#1^2+445\,624\,941\,197\,520\,\#1^3+28\,073\,792\,698\,686\,\#1^4+1\,212\,519\,412\,626\,\#1^5+36\,264\,599\,809\,\#1^6+739\,166\,992\,\#1^7+9\,784\,416\,\#1^8+75\,520\,\#1^9+256\,\#1^{10}\&,9\right]\right)}\right)\right\},$$

$$\left\{s \to \frac{1}{2}\left(-11-\sqrt{\left(121+4\,\text{Root}\left[80\,959\,559\,679\,180\,000+28\,860\,596\,544\,402\,000\,\#1+4\,650\,677\,412\,832\,800\,\#1^2+445\,624\,941\,197\,520\,\#1^3+28\,073\,792\,698\,686\,\#1^4+1\,212\,519\,412\,626\,\#1^5+36\,264\,599\,809\,\#1^6+739\,166\,992\,\#1^7+9\,784\,416\,\#1^8+75\,520\,\#1^9+256\,\#1^{10}\&,10\right]\right)}\right)\right\},$$

$$\left\{s \to \frac{1}{2}\left(-11+\sqrt{\left(121+4\,\text{Root}\left[80\,959\,559\,679\,180\,000+28\,860\,596\,544\,402\,000\,\#1+4\,650\,677\,412\,832\,800\,\#1^2+445\,624\,941\,197\,520\,\#1^3+28\,073\,792\,698\,686\,\#1^4+1\,212\,519\,412\,626\,\#1^5+36\,264\,599\,809\,\#1^6+739\,166\,992\,\#1^7+9\,784\,416\,\#1^8+75\,520\,\#1^9+256\,\#1^{10}\&,10\right]\right)}\right)\right\}\right\}$$