

In this file, we verify that  $P\_G(\text{lambda})^{\{\frac{1}{n}\}}$  is **not** maximized by the generalized Petersen graphs  $P_{\{5, 2\}}$  and  $P_{\{7, 2\}}$ .

```

> p10(x) := 5*x^4 + 30*x^3 + 30*x^2 + 10*x + 1;
p14(x) := (48*x^5 + 147*x^4 + 154*x^3 + 70*x^2 + 14*x + 1);
p20(x) := (5*x^8 + 320*x^7 + 1240*x^6 + 1912*x^5 + 1510*x^4 + 660*x^3
+ 160*x^2 + 20*x + 1);

p6 := x ↦ 2·x3 + 6·x2 + 6·x + 1
p8 := x ↦ 8·x3 + 16·x2 + 8·x + 1
p10 := x ↦ 5·x4 + 30·x3 + 30·x2 + 10·x + 1
p12 := x ↦ 3·x5 + 42·x4 + 76·x3 + 48·x2 + 12·x + 1
p14 := x ↦ 48·x5 + 147·x4 + 154·x3 + 70·x2 + 14·x + 1
p20 := x ↦ 5·x8 + 320·x7 + 1240·x6 + 1912·x5 + 1510·x4 + 660·x3 + 160·x2 + 20·x + 1 (1)

>
> solutions := solve( p20(x)7 - p14(x)10 = 0, {x}, useassumptions ) assuming x > 0;
solutions := {x = RootOf( 78125 _Z51 + 35000000 _Z50 + 6855625000 _Z49 + 769089125000 _Z48 (2)
+ 54389374156250 _Z47 + 2518186190187500 _Z46 + 12168481569654976 _Z45
- 429188691738503860 _Z44 - 8389894014699347325 _Z43 - 80303950230651637840 _Z42
- 516664135834334852000 _Z41 - 2485704676679822213312 _Z40
- 9447868563431184005420 _Z39 - 29351747759656206851400 _Z38
- 76286900609145702895600 _Z37 - 168705748958822551706440 _Z36
- 321549269106537418945148 _Z35 - 533527467552613126297180 _Z34
- 776838476355243662825920 _Z33 - 999036392137666926717940 _Z32
- 1140795913492617435265940 _Z31 - 1161720257589679495556728 _Z30
- 1058812657199400935829760 _Z29 - 866240278714800688840120 _Z28
- 637673322823728068373090 _Z27 - 423183800205073883865680 _Z26
- 253556482435064178256992 _Z25 - 137312244776967050426160 _Z24
- 67258624300631076977120 _Z23 - 29809499069156693941600 _Z22
- 11954879129129059281760 _Z21 - 4336979425117688886880 _Z20
- 1422320975839540298515 _Z19 - 421244119124869905480 _Z18
- 112508234556599294840 _Z17 - 27049029782162045040 _Z16
- 5840251029760551446 _Z15 - 1129232045233712980 _Z14 - 194846067578576960 _Z13
- 29875567162479220 _Z12 - 4049689366810465 _Z11 - 482264514806528 _Z10
- 50068626353600 _Z9 - 4488665825840 _Z8 - 343333370660 _Z7 - 22061653880 _Z6

```

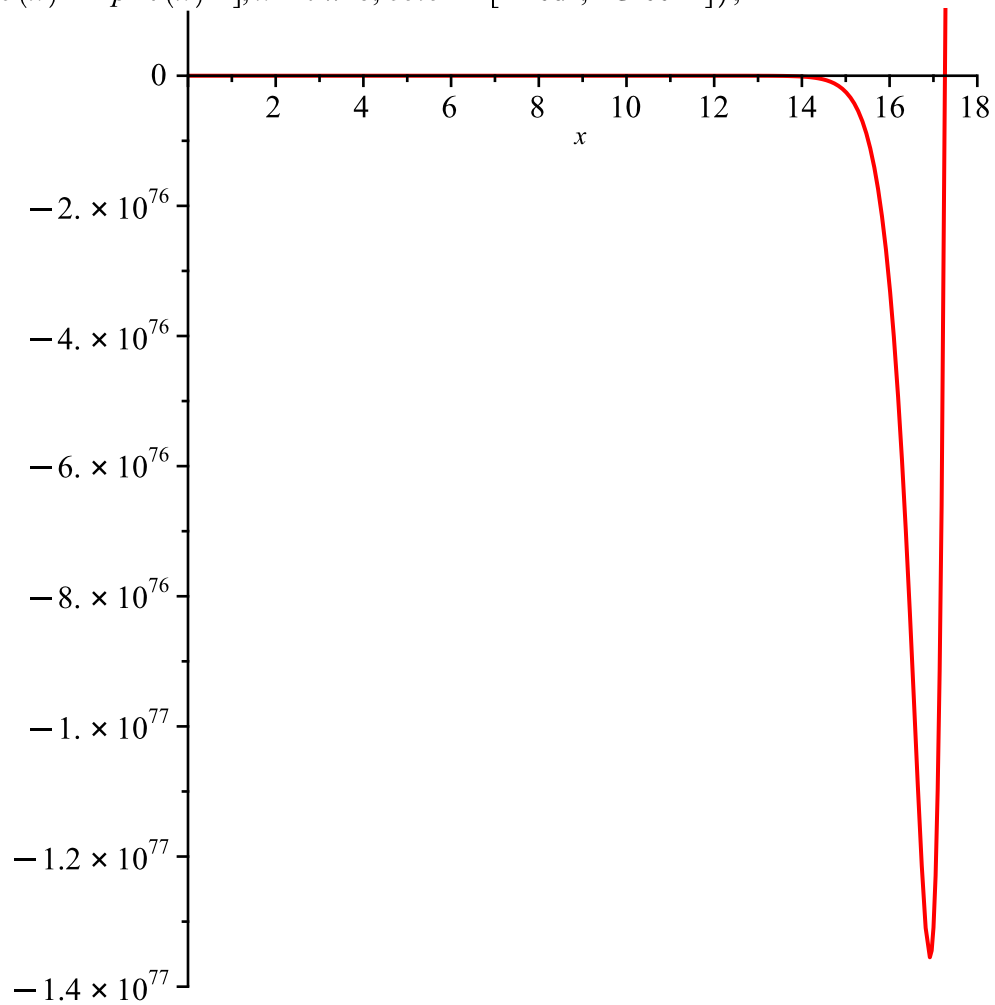
```
- 1166751792 _Z5 - 49371000 _Z4 - 1604190 _Z3 - 37500 _Z2 - 560 _Z - 4, index=1 ) }
```

```
> evalf(solutions)
```

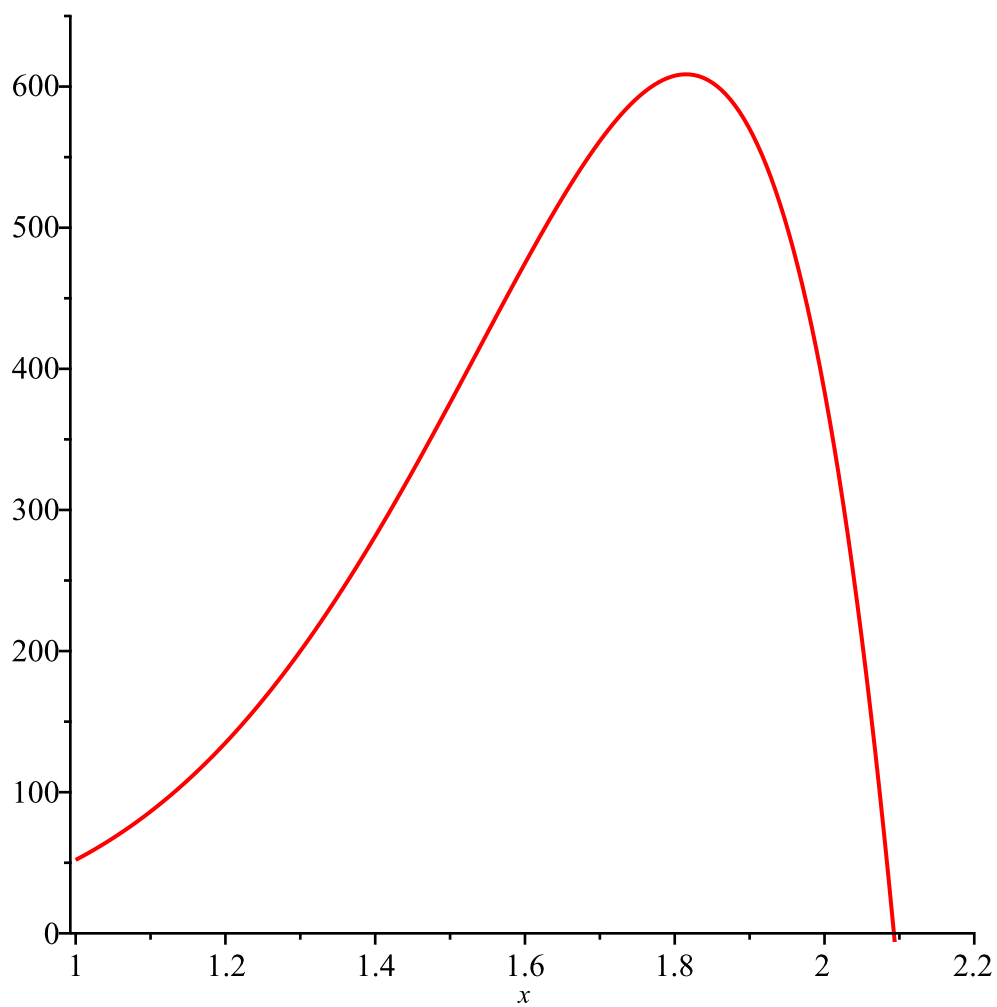
```
{x = 17.26474975 }
```

(3)

```
> plot([p20(x)7 - p14(x)10], x = 0 .. 18, color = ["Red", "Green"]);
```



```
> plot([p20(x) - p10(x)2], x = 1 .. 2.2, color = ["Red", "Green"]);
```



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=
> simplify(p20(x) - p10(x)^2)
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$$-20 x^5 \left( x^3 - x^2 - 2 x - \frac{3}{5} \right)$$

(4)

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=
>
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