

Call `zm_roots` to find the roots of $f(x) = (110\text{th degree polynomial})$

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zm_roots. Function      1 Root      1 =  
-6.9736081298427782718029346318524131325268782039171M-1 -  
7.1672023587583118095725779363125664405610278673951M-1 i  
zm_roots. Function      1 Root      2 =  
-6.9736081298427782718029346318524131325268782039171M-1 +  
7.1672023587583118095725779363125664405610278673951M-1 i  
zm_roots. Function      1 Root      3 =  
6.9459663579459146231437398966206793525392798951870M-1 +  
7.1939941169202777053923317857568336359998028114402M-1 i  
zm_roots. Function      1 Root      4 =  
6.9459663579459146231437398966206793525392798951870M-1 -  
7.1939941169202777053923317857568336359998028114402M-1 i  
zm_roots. Function      1 Root      5 =  
9.9702014614548326696111375450097692483096919833276M-1 -  
7.7141611209769191899416525627412226856836620369904M-2 i  
zm_roots. Function      1 Root      6 =  
9.9702014614548326696111375450097692483096919833276M-1 +  
7.7141611209769191899416525627412226856836620369904M-2 i  
zm_roots. Function      1 Root      7 =  
6.5257375089087743980495867513151732482004036120308M-1 +  
7.5772521381316791696705295169504561605123095285393M-1 i  
zm_roots. Function      1 Root      8 =  
6.5257375089087743980495867513151732482004036120308M-1 -  
7.5772521381316791696705295169504561605123095285393M-1 i  
zm_roots. Function      1 Root      9 =  
-9.2123384359628835321182656038001097503987535785724M-1 +  
3.8900926134580565833099008914533324214508523637702M-1 i  
zm_roots. Function      1 Root     10 =  
-9.2123384359628835321182656038001097503987535785724M-1 -  
3.8900926134580565833099008914533324214508523637702M-1 i  
zm_roots. Function      1 Root     11 =  
6.0841871477566846066363839927203369324878351094250M-1 -  
7.9361619660307071428516009633646003346672793824489M-1 i  
zm_roots. Function      1 Root     12 =  
6.0841871477566846066363839927203369324878351094250M-1 +  
7.9361619660307071428516009633646003346672793824489M-1 i  
zm_roots. Function      1 Root     13 =  
-2.5525886143814302715707932889571375788721110999584M-1 +  
9.6687274946463502999076081184391053893678904868111M-1 i  
zm_roots. Function      1 Root     14 =  
-2.5525886143814302715707932889571375788721110999584M-1 -  
9.6687274946463502999076081184391053893678904868111M-1 i  
zm_roots. Function      1 Root     15 =  
1.9692163175148841622760261485313043172515152677589M-1 +  
9.8041923224115263641361220153676417541115617697493M-1 i  
zm_roots. Function      1 Root     16 =  
1.9692163175148841622760261485313043172515152677589M-1 -  
9.8041923224115263641361220153676417541115617697493M-1 i  
zm_roots. Function      1 Root     17 =  
-2.9910334353626816374182543195665004554946697210605M-2 -  
9.9955258585972066480004727093418572232456823389020M-1 i  
zm_roots. Function      1 Root     18 =  
-2.9910334353626816374182543195665004554946697210605M-2 +  
9.9955258585972066480004727093418572232456823389020M-1 i
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zm_roots. Function      1 Root      19 =
      8.9485162923226569325793812511409229762364342462491M-1 +
      4.4636371006205207743797282550359953458839976653750M-1 i
zm_roots. Function      1 Root      20 =
      8.9485162923226569325793812511409229762364342462491M-1 -
      4.4636371006205207743797282550359953458839976653750M-1 i
zm_roots. Function      1 Root      21 =
      -4.1623097776855346952339357167427193314333002446156M-1 -
      9.0925891425150952292624148140821256444677290816669M-1 i
zm_roots. Function      1 Root      22 =
      -4.1623097776855346952339357167427193314333002446156M-1 +
      9.0925891425150952292624148140821256444677290816669M-1 i
zm_roots. Function      1 Root      23 =
      8.3874642704983468236362304836972441753960019860919M-1 +
      5.4452220442433414824633996180976755710273214894656M-1 i
zm_roots. Function      1 Root      24 =
      8.3874642704983468236362304836972441753960019860919M-1 -
      5.4452220442433414824633996180976755710273214894656M-1 i
zm_roots. Function      1 Root      25 =
      -9.8537429817684471555986132672893006679937326256770M-1 +
      1.7040390985095007810235693463583682342291733774109M-1 i
zm_roots. Function      1 Root      26 =
      -9.8537429817684471555986132672893006679937326256770M-1 -
      1.7040390985095007810235693463583682342291733774109M-1 i
zm_roots. Function      1 Root      27 =
      -8.0928375833076626205093815181540874353028349068404M-1 -
      5.8741790788333131029824687169618017064641685791789M-1 i
zm_roots. Function      1 Root      28 =
      -8.0928375833076626205093815181540874353028349068404M-1 +
      5.8741790788333131029824687169618017064641685791789M-1 i
zm_roots. Function      1 Root      29 =
      -8.6850101864613477317375619900949362311284695938512M-2 +
      9.9622139095991422231410713704590742120887829725278M-1 i
zm_roots. Function      1 Root      30 =
      -8.6850101864613477317375619900949362311284695938512M-2 -
      9.9622139095991422231410713704590742120887829725278M-1 i
zm_roots. Function      1 Root      31 =
      9.8312044132836315303369104925086834653224371841508M-1 -
      1.8295955247629040714982572594048878828326512490631M-1 i
zm_roots. Function      1 Root      32 =
      9.8312044132836315303369104925086834653224371841508M-1 +
      1.8295955247629040714982572594048878828326512490631M-1 i
zm_roots. Function      1 Root      33 =
      -3.6369698750052786196415721203883708777531528420522M-1 -
      9.3151731131688630585053248062305844608089448361265M-1 i
zm_roots. Function      1 Root      34 =
      -3.6369698750052786196415721203883708777531528420522M-1 +
      9.3151731131688630585053248062305844608089448361265M-1 i
zm_roots. Function      1 Root      35 =
      2.7122524398530407085369994678508724361304815466999M-2 +
      9.9963211666605186299143623901680989615978584940499M-1 i
zm_roots. Function      1 Root      36 =
      2.7122524398530407085369994678508724361304815466999M-2 -
      9.9963211666605186299143623901680989615978584940499M-1 i
zm_roots. Function      1 Root      37 =
      -9.9349084217982552378273425718476872917525963600237M-1 -
      1.1391201211821786574048026098665604641551372004645M-1 i
zm_roots. Function      1 Root      38 =

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-9.9349084217982552378273425718476872917525963600237M-1 +
    1.1391201211821786574048026098665604641551372004645M-1 i
zm_roots. Function      1 Root      39 =
    4.6463106701481629010588141502503264615195071189327M-1 +
    8.8550435999190500520966407151837247559232839326521M-1 i
zm_roots. Function      1 Root      40 =
    4.6463106701481629010588141502503264615195071189327M-1 -
    8.8550435999190500520966407151837247559232839326521M-1 i
zm_roots. Function      1 Root      41 =
    9.5700452680022113764915763383217281219333819810395M-1 +
    2.9007298337467559182690002608579701114467563910869M-1 i
zm_roots. Function      1 Root      42 =
    9.5700452680022113764915763383217281219333819810395M-1 -
    2.9007298337467559182690002608579701114467563910869M-1 i
zm_roots. Function      1 Root      43 =
    -8.4147527891190522306860021910382452367829351801487M-1 -
    5.4029561813893263610229929893987151716010121935211M-1 i
zm_roots. Function      1 Root      44 =
    -8.4147527891190522306860021910382452367829351801487M-1 +
    5.4029561813893263610229929893987151716010121935211M-1 i
zm_roots. Function      1 Root      45 =
    -5.6505135888522169717213011150492671544771430066125M-1 -
    8.2505573255505860461795975606782189363380089601270M-1 i
zm_roots. Function      1 Root      46 =
    -5.6505135888522169717213011150492671544771430066125M-1 +
    8.2505573255505860461795975606782189363380089601270M-1 i
zm_roots. Function      1 Root      47 =
    7.7170630731941418214400566118602312880136978870617M-1 +
    6.3597906824315678344566008338164208572465113787067M-1 i
zm_roots. Function      1 Root      48 =
    7.7170630731941418214400566118602312880136978870617M-1 -
    6.3597906824315678344566008338164208572465113787067M-1 i
zm_roots. Function      1 Root      49 =
    -9.5954956471742718012496800578977995315615825997972M-1 +
    2.8153975358836277084785689244940001825149778141311M-1 i
zm_roots. Function      1 Root      50 =
    -9.5954956471742718012496800578977995315615825997972M-1 -
    2.8153975358836277084785689244940001825149778141311M-1 i
zm_roots. Function      1 Root      51 =
    8.4062459238462888911916025317659243502452968326836M-2 -
    9.9646048739866337225865533755565894842289912680327M-1 i
zm_roots. Function      1 Root      52 =
    8.4062459238462888911916025317659243502452968326836M-2 +
    9.9646048739866337225865533755565894842289912680327M-1 i
zm_roots. Function      1 Root      53 =
    9.9967321455670056134902604545041320486417389626361M-1 +
    2.5562943842071962962738854745906182463945832923492M-2 i
zm_roots. Function      1 Root      54 =
    9.9967321455670056134902604545041320486417389626361M-1 -
    2.5562943842071962962738854745906182463945832923492M-2 i
zm_roots. Function      1 Root      55 =
    3.6091301175141371317002770560661848047456278549108M-1 +
    9.3259948420987447326185740671355374545440731880711M-1 i
zm_roots. Function      1 Root      56 =
    3.6091301175141371317002770560661848047456278549108M-1 -
    9.3259948420987447326185740671355374545440731880711M-1 i
zm_roots. Function      1 Root      57 =
    -6.5534270761474455083905149625072515279735414012467M-1 -

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7.5533167256257395372722661765380597601441555509022M-1 i
zm_roots. Function 1 Root 58 =
-6.5534270761474455083905149625072515279735414012467M-1 +
7.5533167256257395372722661765380597601441555509022M-1 i
zm_roots. Function 1 Root 59 =
-8.9754175905844145634717496645980383590445395581956M-1 +
4.4092946232507374142554052178693537558515029539651M-1 i
zm_roots. Function 1 Root 60 =
-8.9754175905844145634717496645980383590445395581956M-1 -
4.4092946232507374142554052178693537558515029539651M-1 i
zm_roots. Function 1 Root 61 =
9.1857495053149539008219089245732097848700185901142M-1 +
3.9524683459334724566761957481125737863021754036198M-1 i
zm_roots. Function 1 Root 62 =
9.1857495053149539008219089245732097848700185901142M-1 -
3.9524683459334724566761957481125737863021754036198M-1 i
zm_roots. Function 1 Root 63 =
-5.1707262166174416510362756351800852983190749453720M-1 +
8.5594153067125489187814770965065676247051313916311M-1 i
zm_roots. Function 1 Root 64 =
-5.1707262166174416510362756351800852983190749453720M-1 -
8.5594153067125489187814770965065676247051313916311M-1 i
zm_roots. Function 1 Root 65 =
4.1344844518675880409825153462927707371840687161794M-1 +
9.1052753015636583808273618335834278470025798946707M-1 i
zm_roots. Function 1 Root 66 =
4.1344844518675880409825153462927707371840687161794M-1 -
9.1052753015636583808273618335834278470025798946707M-1 i
zm_roots. Function 1 Root 67 =
8.0654252704344731006123437087686748356900966351223M-1 +
5.9117607535350249870723145063306137439520682566400M-1 i
zm_roots. Function 1 Root 68 =
8.0654252704344731006123437087686748356900966351223M-1 -
5.9117607535350249870723145063306137439520682566400M-1 i
zm_roots. Function 1 Root 69 =
5.1429400061598085724002444330533288507148781663540M-1 +
8.5761394632457410943759126376548767928904611050369M-1 i
zm_roots. Function 1 Root 70 =
5.1429400061598085724002444330533288507148781663540M-1 -
8.5761394632457410943759126376548767928904611050369M-1 i
zm_roots. Function 1 Root 71 =
-9.4192560931937536265788610228454896958805594584972M-1 -
3.3582159922840498103813163499065809157759623657540M-1 i
zm_roots. Function 1 Root 72 =
-9.4192560931937536265788610228454896958805594584972M-1 +
3.3582159922840498103813163499065809157759623657540M-1 i
zm_roots. Function 1 Root 73 =
-1.9970841608806152811276258775397157414757374779418M-1 -
9.7985537123781573288728254207268946205049926162893M-1 i
zm_roots. Function 1 Root 74 =
-1.9970841608806152811276258775397157414757374779418M-1 +
9.7985537123781573288728254207268946205049926162893M-1 i
zm_roots. Function 1 Root 75 =
-8.7092663349754926849897544997386248031423399140659M-1 +
4.9141306358767620008936362368725707890917646335153M-1 i
zm_roots. Function 1 Root 76 =
-8.7092663349754926849897544997386248031423399140659M-1 -
4.9141306358767620008936362368725707890917646335153M-1 i

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zm_roots. Function      1 Root      77 =
7.3435058055976593550033506921361658608227329829845M-1 +
6.7877037710225298317517702186235266142473393822064M-1 i
zm_roots. Function      1 Root      78 =
7.3435058055976593550033506921361658608227329829845M-1 -
6.7877037710225298317517702186235266142473393822064M-1 i
zm_roots. Function      1 Root      79 =
1.4072376077318789841073854432321585156711679327755M-1 +
9.9004889937510186744814750716667311303039002799270M-1 i
zm_roots. Function      1 Root      80 =
1.4072376077318789841073854432321585156711679327755M-1 -
9.9004889937510186744814750716667311303039002799270M-1 i
zm_roots. Function      1 Root      81 =
9.9155814022616680310583219985510562864493128759553M-1 -
1.2966284954151412877284775314245092006018074610638M-1 i
zm_roots. Function      1 Root      82 =
9.9155814022616680310583219985510562864493128759553M-1 +
1.2966284954151412877284775314245092006018074610638M-1 i
zm_roots. Function      1 Root      83 =
5.6227534596099014299621205097345503863500979597423M-1 +
8.2695008030983880283977294736486523245762587597828M-1 i
zm_roots. Function      1 Root      84 =
5.6227534596099014299621205097345503863500979597423M-1 -
8.2695008030983880283977294736486523245762587597828M-1 i
zm_roots. Function      1 Root      85 =
-7.3710881717991232322009088122306129133205024806506M-1 +
6.7577406848415735247498249208959633304884075563084M-1 i
zm_roots. Function      1 Root      86 =
-7.3710881717991232322009088122306129133205024806506M-1 -
6.7577406848415735247498249208959633304884075563084M-1 i
zm_roots. Function      1 Root      87 =
-9.9837138250495732335482475734571095088231215630081M-1 +
5.7048949115125637057833007267626187569965206016970M-2 i
zm_roots. Function      1 Root      88 =
-9.9837138250495732335482475734571095088231215630081M-1 -
5.7048949115125637057833007267626187569965206016970M-2 i
zm_roots. Function      1 Root      89 =
9.7161203652866932858507356101060374997443715114579M-1 -
2.3657990293474156019426855839264460870028553777594M-1 i
zm_roots. Function      1 Root      90 =
9.7161203652866932858507356101060374997443715114579M-1 +
2.3657990293474156019426855839264460870028553777594M-1 i
zm_roots. Function      1 Root      91 =
-3.0998121404806046897589098836482583164127761730326M-1 +
9.5074268176898975221731572903719866039512724601120M-1 i
zm_roots. Function      1 Root      92 =
-3.0998121404806046897589098836482583164127761730326M-1 -
9.5074268176898975221731572903719866039512724601120M-1 i
zm_roots. Function      1 Root      93 =
-4.6741183482569273930668160182363569829617702935057M-1 +
8.8403969179267020517196754131029881848964891296275M-1 i
zm_roots. Function      1 Root      94 =
-4.6741183482569273930668160182363569829617702935057M-1 -
8.8403969179267020517196754131029881848964891296275M-1 i
zm_roots. Function      1 Root      95 =
-7.7445707246131796140344589851243458810597442954815M-1 +
6.3262646396957256951490450723220534476376420930551M-1 i
zm_roots. Function      1 Root      96 =

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-7.7445707246131796140344589851243458810597442954815M-1 -
6.3262646396957256951490450723220534476376420930551M-1 i
zm_roots. Function      1 Root      97 =
3.0719607061760985684035042348273636788170044783545M-1 -
9.5164624425103494336194899483648898077053967828311M-1 i
zm_roots. Function      1 Root      98 =
3.0719607061760985684035042348273636788170044783545M-1 +
9.5164624425103494336194899483648898077053967828311M-1 i
zm_roots. Function      1 Root      99 =
8.6821419462527311918105585002614559778401191908691M-1 +
4.9618959305006425054871556672060109260722597594539M-1 i
zm_roots. Function      1 Root     100 =
8.6821419462527311918105585002614559778401191908691M-1 -
4.9618959305006425054871556672060109260722597594539M-1 i
zm_roots. Function      1 Root     101 =
-1.4351106445894258462492558952458647331820364313198M-1 +
9.8964871261365324251739903109108171407809801804712M-1 i
zm_roots. Function      1 Root     102 =
-1.4351106445894258462492558952458647331820364313198M-1 -
9.8964871261365324251739903109108171407809801804712M-1 i
zm_roots. Function      1 Root     103 =
-6.1119155313990210349321079386181431009591322654377M-1 -
7.9148271324801164173686328313252142968261070521826M-1 i
zm_roots. Function      1 Root     104 =
-6.1119155313990210349321079386181431009591322654377M-1 +
7.9148271324801164173686328313252142968261070521826M-1 i
zm_roots. Function      1 Root     105 =
-9.7404822471375991859257625435506024878494788548451M-1 -
2.2634057508978071286493648328397448264486476735870M-1 i
zm_roots. Function      1 Root     106 =
-9.7404822471375991859257625435506024878494788548451M-1 +
2.2634057508978071286493648328397448264486476735870M-1 i
zm_roots. Function      1 Root     107 =
9.3931202847645706068228202284694428765078311286551M-1 +
3.4306400737973594644687179206982153575868743243547M-1 i
zm_roots. Function      1 Root     108 =
9.3931202847645706068228202284694428765078311286551M-1 -
3.4306400737973594644687179206982153575868743243547M-1 i
zm_roots. Function      1 Root     109 =
2.5247279065797749862133163097034553123105728827168M-1 +
9.6760399439924444221515480117771111818699981169209M-1 i
zm_roots. Function      1 Root     110 =
2.5247279065797749862133163097034553123105728827168M-1 -
9.6760399439924444221515480117771111818699981169209M-1 i

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Sort these roots by argument and check how close they lie to the unit circle.

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9.9967321455670056134902604545041320486417389626361M-1 +
2.5562943842071962962738854745906182463945832923492M-2 i
Argument (degrees) = 1.4648083569 Magnitude = 1.0000000000

9.9702014614548326696111375450097692483096919833276M-1 +
7.7141611209769191899416525627412226856836620369904M-2 i
Argument (degrees) = 4.4242841942 Magnitude = 1.0000000000

9.9155814022616680310583219985510562864493128759553M-1 +
1.2966284954151412877284775314245092006018074610638M-1 i
Argument (degrees) = 7.4501101223 Magnitude = 1.0000000000

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9.8312044132836315303369104925086834653224371841508M-1 +
1.8295955247629040714982572594048878828326512490631M-1 i
Argument (degrees) = 10.5421930519 Magnitude = 1.0000000000

9.7161203652866932858507356101060374997443715114579M-1 +
2.3657990293474156019426855839264460870028553777594M-1 i
Argument (degrees) = 13.6847709580 Magnitude = 1.0000000000

9.5700452680022113764915763383217281219333819810395M-1 +
2.9007298337467559182690002608579701114467563910869M-1 i
Argument (degrees) = 16.8623254804 Magnitude = 1.0000000000

9.3931202847645706068228202284694428765078311286551M-1 +
3.4306400737973594644687179206982153575868743243547M-1 i
Argument (degrees) = 20.0636602986 Magnitude = 1.0000000000

9.1857495053149539008219089245732097848700185901142M-1 +
3.9524683459334724566761957481125737863021754036198M-1 i
Argument (degrees) = 23.2813693900 Magnitude = 1.0000000000

8.9485162923226569325793812511409229762364342462491M-1 +
4.4636371006205207743797282550359953458839976653750M-1 i
Argument (degrees) = 26.5106215997 Magnitude = 1.0000000000

8.6821419462527311918105585002614559778401191908691M-1 +
4.9618959305006425054871556672060109260722597594539M-1 i
Argument (degrees) = 29.7482240801 Magnitude = 1.0000000000

8.3874642704983468236362304836972441753960019860919M-1 +
5.4452220442433414824633996180976755710273214894656M-1 i
Argument (degrees) = 32.9920188006 Magnitude = 1.0000000000

8.0654252704344731006123437087686748356900966351223M-1 +
5.9117607535350249870723145063306137439520682566400M-1 i
Argument (degrees) = 36.2405105632 Magnitude = 1.0000000000

7.7170630731941418214400566118602312880136978870617M-1 +
6.3597906824315678344566008338164208572465113787067M-1 i
Argument (degrees) = 39.4926380102 Magnitude = 1.0000000000

7.3435058055976593550033506921361658608227329829845M-1 +
6.7877037710225298317517702186235266142473393822064M-1 i
Argument (degrees) = 42.7476305375 Magnitude = 1.0000000000

6.9459663579459146231437398966206793525392798951870M-1 +
7.1939941169202777053923317857568336359998028114402M-1 i
Argument (degrees) = 46.0049169936 Magnitude = 1.0000000000

6.5257375089087743980495867513151732482004036120308M-1 +
7.5772521381316791696705295169504561605123095285393M-1 i
Argument (degrees) = 49.2640660911 Magnitude = 1.0000000000

6.0841871477566846066363839927203369324878351094250M-1 +
7.9361619660307071428516009633646003346672793824489M-1 i
Argument (degrees) = 52.5247466361 Magnitude = 1.0000000000

5.6227534596099014299621205097345503863500979597423M-1 +

8.2695008030983880283977294736486523245762587597828M-1 i
Argument (degrees) = 55.7867004129 Magnitude = 1.0000000000

5.1429400061598085724002444330533288507148781663540M-1 +
8.5761394632457410943759126376548767928904611050369M-1 i
Argument (degrees) = 59.0497233266 Magnitude = 1.0000000000

4.6463106701481629010588141502503264615195071189327M-1 +
8.8550435999190500520966407151837247559232839326521M-1 i
Argument (degrees) = 62.3136520451 Magnitude = 1.0000000000

4.1344844518675880409825153462927707371840687161794M-1 +
9.1052753015636583808273618335834278470025798946707M-1 i
Argument (degrees) = 65.5783543740 Magnitude = 1.0000000000

3.6091301175141371317002770560661848047456278549108M-1 +
9.3259948420987447326185740671355374545440731880711M-1 i
Argument (degrees) = 68.8437222137 Magnitude = 1.0000000000

3.0719607061760985684035042348273636788170044783545M-1 +
9.5164624425103494336194899483648898077053967828311M-1 i
Argument (degrees) = 72.1096663298 Magnitude = 1.0000000000

2.5247279065797749862133163097034553123105728827168M-1 +
9.6760399439924444221515480117771111818699981169209M-1 i
Argument (degrees) = 75.3761124197 Magnitude = 1.0000000000

1.9692163175148841622760261485313043172515152677589M-1 +
9.8041923224115263641361220153676417541115617697493M-1 i
Argument (degrees) = 78.6429981166 Magnitude = 1.0000000000

1.4072376077318789841073854432321585156711679327755M-1 +
9.9004889937510186744814750716667311303039002799270M-1 i
Argument (degrees) = 81.9102706829 Magnitude = 1.0000000000

8.4062459238462888911916025317659243502452968326836M-2 +
9.9646048739866337225865533755565894842289912680327M-1 i
Argument (degrees) = 85.1778852145 Magnitude = 1.0000000000

2.7122524398530407085369994678508724361304815466999M-2 +
9.9963211666605186299143623901680989615978584940499M-1 i
Argument (degrees) = 88.4458032299 Magnitude = 1.0000000000

-2.9910334353626816374182543195665004554946697210605M-2 +
9.9955258585972066480004727093418572232456823389020M-1 i
Argument (degrees) = 91.7139915513 Magnitude = 1.0000000000

-8.6850101864613477317375619900949362311284695938512M-2 +
9.9622139095991422231410713704590742120887829725278M-1 i
Argument (degrees) = 94.9824214103 Magnitude = 1.0000000000

-1.4351106445894258462492558952458647331820364313198M-1 +
9.8964871261365324251739903109108171407809801804712M-1 i
Argument (degrees) = 98.2510677265 Magnitude = 1.0000000000

-1.9970841608806152811276258775397157414757374779418M-1 +
9.7985537123781573288728254207268946205049926162893M-1 i
Argument (degrees) = 101.5199085222 Magnitude = 1.0000000000

-2.5525886143814302715707932889571375788721110999584M-1 +
9.6687274946463502999076081184391053893678904868111M-1 i
Argument (degrees) = 104.7889244434 Magnitude = 1.0000000000

-3.0998121404806046897589098836482583164127761730326M-1 +
9.5074268176898975221731572903719866039512724601120M-1 i
Argument (degrees) = 108.0580983661 Magnitude = 1.0000000000

-3.6369698750052786196415721203883708777531528420522M-1 +
9.3151731131688630585053248062305844608089448361265M-1 i
Argument (degrees) = 111.3274150696 Magnitude = 1.0000000000

-4.1623097776855346952339357167427193314333002446156M-1 +
9.0925891425150952292624148140821256444677290816669M-1 i
Argument (degrees) = 114.5968609646 Magnitude = 1.0000000000

-4.6741183482569273930668160182363569829617702935057M-1 +
8.8403969179267020517196754131029881848964891296275M-1 i
Argument (degrees) = 117.8664238655 Magnitude = 1.0000000000

-5.1707262166174416510362756351800852983190749453720M-1 +
8.5594153067125489187814770965065676247051313916311M-1 i
Argument (degrees) = 121.1360927983 Magnitude = 1.0000000000

-5.6505135888522169717213011150492671544771430066125M-1 +
8.2505573255505860461795975606782189363380089601270M-1 i
Argument (degrees) = 124.4058578378 Magnitude = 1.0000000000

-6.1119155313990210349321079386181431009591322654377M-1 +
7.9148271324801164173686328313252142968261070521826M-1 i
Argument (degrees) = 127.6757099695 Magnitude = 1.0000000000

-6.5534270761474455083905149625072515279735414012467M-1 +
7.5533167256257395372722661765380597601441555509022M-1 i
Argument (degrees) = 130.9456409705 Magnitude = 1.0000000000

-6.9736081298427782718029346318524131325268782039171M-1 +
7.1672023587583118095725779363125664405610278673951M-1 i
Argument (degrees) = 134.2156433079 Magnitude = 1.0000000000

-7.3710881717991232322009088122306129133205024806506M-1 +
6.7577406848415735247498249208959633304884075563084M-1 i
Argument (degrees) = 137.4857100507 Magnitude = 1.0000000000

-7.7445707246131796140344589851243458810597442954815M-1 +
6.3262646396957256951490450723220534476376420930551M-1 i
Argument (degrees) = 140.7558347925 Magnitude = 1.0000000000

-8.0928375833076626205093815181540874353028349068404M-1 +
5.8741790788333131029824687169618017064641685791789M-1 i
Argument (degrees) = 144.0260115851 Magnitude = 1.0000000000

-8.4147527891190522306860021910382452367829351801487M-1 +
5.4029561813893263610229929893987151716010121935211M-1 i
Argument (degrees) = 147.2962348796 Magnitude = 1.0000000000

-8.7092663349754926849897544997386248031423399140659M-1 +

4.9141306358767620008936362368725707890917646335153M-1 i
Argument (degrees) = 150.5664994735 Magnitude = 1.0000000000

-8.9754175905844145634717496645980383590445395581956M-1 +
4.4092946232507374142554052178693537558515029539651M-1 i
Argument (degrees) = 153.8368004653 Magnitude = 1.0000000000

-9.2123384359628835321182656038001097503987535785724M-1 +
3.8900926134580565833099008914533324214508523637702M-1 i
Argument (degrees) = 157.1071332123 Magnitude = 1.0000000000

-9.4192560931937536265788610228454896958805594584972M-1 +
3.3582159922840498103813163499065809157759623657540M-1 i
Argument (degrees) = 160.3774932933 Magnitude = 1.0000000000

-9.5954956471742718012496800578977995315615825997972M-1 +
2.8153975358836277084785689244940001825149778141311M-1 i
Argument (degrees) = 163.6478764741 Magnitude = 1.0000000000

-9.7404822471375991859257625435506024878494788548451M-1 +
2.2634057508978071286493648328397448264486476735870M-1 i
Argument (degrees) = 166.9182786764 Magnitude = 1.0000000000

-9.8537429817684471555986132672893006679937326256770M-1 +
1.7040390985095007810235693463583682342291733774109M-1 i
Argument (degrees) = 170.1886959485 Magnitude = 1.0000000000

-9.9349084217982552378273425718476872917525963600237M-1 +
1.1391201211821786574048026098665604641551372004645M-1 i
Argument (degrees) = 173.4591244380 Magnitude = 1.0000000000

-9.9837138250495732335482475734571095088231215630081M-1 +
5.7048949115125637057833007267626187569965206016970M-2 i
Argument (degrees) = 176.7295603655 Magnitude = 1.0000000000

-9.9837138250495732335482475734571095088231215630081M-1 -
5.7048949115125637057833007267626187569965206016970M-2 i
Argument (degrees) = 183.2704396345 Magnitude = 1.0000000000

-9.9349084217982552378273425718476872917525963600237M-1 -
1.1391201211821786574048026098665604641551372004645M-1 i
Argument (degrees) = 186.5408755620 Magnitude = 1.0000000000

-9.8537429817684471555986132672893006679937326256770M-1 -
1.7040390985095007810235693463583682342291733774109M-1 i
Argument (degrees) = 189.8113040515 Magnitude = 1.0000000000

-9.7404822471375991859257625435506024878494788548451M-1 -
2.2634057508978071286493648328397448264486476735870M-1 i
Argument (degrees) = 193.0817213236 Magnitude = 1.0000000000

-9.5954956471742718012496800578977995315615825997972M-1 -
2.8153975358836277084785689244940001825149778141311M-1 i
Argument (degrees) = 196.3521235259 Magnitude = 1.0000000000

-9.4192560931937536265788610228454896958805594584972M-1 -
3.3582159922840498103813163499065809157759623657540M-1 i
Argument (degrees) = 199.6225067067 Magnitude = 1.0000000000

-9.2123384359628835321182656038001097503987535785724M-1 -
3.8900926134580565833099008914533324214508523637702M-1 i
Argument (degrees) = 202.8928667877 Magnitude = 1.0000000000

-8.9754175905844145634717496645980383590445395581956M-1 -
4.4092946232507374142554052178693537558515029539651M-1 i
Argument (degrees) = 206.1631995347 Magnitude = 1.0000000000

-8.7092663349754926849897544997386248031423399140659M-1 -
4.9141306358767620008936362368725707890917646335153M-1 i
Argument (degrees) = 209.4335005265 Magnitude = 1.0000000000

-8.4147527891190522306860021910382452367829351801487M-1 -
5.4029561813893263610229929893987151716010121935211M-1 i
Argument (degrees) = 212.7037651204 Magnitude = 1.0000000000

-8.0928375833076626205093815181540874353028349068404M-1 -
5.8741790788333131029824687169618017064641685791789M-1 i
Argument (degrees) = 215.9739884149 Magnitude = 1.0000000000

-7.7445707246131796140344589851243458810597442954815M-1 -
6.3262646396957256951490450723220534476376420930551M-1 i
Argument (degrees) = 219.2441652075 Magnitude = 1.0000000000

-7.3710881717991232322009088122306129133205024806506M-1 -
6.7577406848415735247498249208959633304884075563084M-1 i
Argument (degrees) = 222.5142899493 Magnitude = 1.0000000000

-6.9736081298427782718029346318524131325268782039171M-1 -
7.1672023587583118095725779363125664405610278673951M-1 i
Argument (degrees) = 225.7843566921 Magnitude = 1.0000000000

-6.5534270761474455083905149625072515279735414012467M-1 -
7.5533167256257395372722661765380597601441555509022M-1 i
Argument (degrees) = 229.0543590295 Magnitude = 1.0000000000

-6.1119155313990210349321079386181431009591322654377M-1 -
7.9148271324801164173686328313252142968261070521826M-1 i
Argument (degrees) = 232.3242900305 Magnitude = 1.0000000000

-5.6505135888522169717213011150492671544771430066125M-1 -
8.2505573255505860461795975606782189363380089601270M-1 i
Argument (degrees) = 235.5941421622 Magnitude = 1.0000000000

-5.1707262166174416510362756351800852983190749453720M-1 -
8.5594153067125489187814770965065676247051313916311M-1 i
Argument (degrees) = 238.8639072017 Magnitude = 1.0000000000

-4.6741183482569273930668160182363569829617702935057M-1 -
8.8403969179267020517196754131029881848964891296275M-1 i
Argument (degrees) = 242.1335761345 Magnitude = 1.0000000000

-4.1623097776855346952339357167427193314333002446156M-1 -
9.0925891425150952292624148140821256444677290816669M-1 i
Argument (degrees) = 245.4031390354 Magnitude = 1.0000000000

-3.6369698750052786196415721203883708777531528420522M-1 -

9.3151731131688630585053248062305844608089448361265M-1 i
Argument (degrees) = 248.6725849304 Magnitude = 1.0000000000

-3.0998121404806046897589098836482583164127761730326M-1 -
9.5074268176898975221731572903719866039512724601120M-1 i
Argument (degrees) = 251.9419016339 Magnitude = 1.0000000000

-2.5525886143814302715707932889571375788721110999584M-1 -
9.6687274946463502999076081184391053893678904868111M-1 i
Argument (degrees) = 255.2110755566 Magnitude = 1.0000000000

-1.9970841608806152811276258775397157414757374779418M-1 -
9.7985537123781573288728254207268946205049926162893M-1 i
Argument (degrees) = 258.4800914778 Magnitude = 1.0000000000

-1.4351106445894258462492558952458647331820364313198M-1 -
9.8964871261365324251739903109108171407809801804712M-1 i
Argument (degrees) = 261.7489322735 Magnitude = 1.0000000000

-8.6850101864613477317375619900949362311284695938512M-2 -
9.9622139095991422231410713704590742120887829725278M-1 i
Argument (degrees) = 265.0175785897 Magnitude = 1.0000000000

-2.9910334353626816374182543195665004554946697210605M-2 -
9.9955258585972066480004727093418572232456823389020M-1 i
Argument (degrees) = 268.2860084487 Magnitude = 1.0000000000

2.7122524398530407085369994678508724361304815466999M-2 -
9.9963211666605186299143623901680989615978584940499M-1 i
Argument (degrees) = 271.5541967701 Magnitude = 1.0000000000

8.4062459238462888911916025317659243502452968326836M-2 -
9.9646048739866337225865533755565894842289912680327M-1 i
Argument (degrees) = 274.8221147855 Magnitude = 1.0000000000

1.4072376077318789841073854432321585156711679327755M-1 -
9.9004889937510186744814750716667311303039002799270M-1 i
Argument (degrees) = 278.0897293171 Magnitude = 1.0000000000

1.9692163175148841622760261485313043172515152677589M-1 -
9.8041923224115263641361220153676417541115617697493M-1 i
Argument (degrees) = 281.3570018834 Magnitude = 1.0000000000

2.5247279065797749862133163097034553123105728827168M-1 -
9.6760399439924444221515480117771111818699981169209M-1 i
Argument (degrees) = 284.6238875803 Magnitude = 1.0000000000

3.0719607061760985684035042348273636788170044783545M-1 -
9.5164624425103494336194899483648898077053967828311M-1 i
Argument (degrees) = 287.8903336702 Magnitude = 1.0000000000

3.6091301175141371317002770560661848047456278549108M-1 -
9.3259948420987447326185740671355374545440731880711M-1 i
Argument (degrees) = 291.1562777863 Magnitude = 1.0000000000

4.1344844518675880409825153462927707371840687161794M-1 -
9.1052753015636583808273618335834278470025798946707M-1 i
Argument (degrees) = 294.4216456260 Magnitude = 1.0000000000

4.6463106701481629010588141502503264615195071189327M-1 -
8.8550435999190500520966407151837247559232839326521M-1 i
Argument (degrees) = 297.6863479549 Magnitude = 1.0000000000

5.1429400061598085724002444330533288507148781663540M-1 -
8.5761394632457410943759126376548767928904611050369M-1 i
Argument (degrees) = 300.9502766734 Magnitude = 1.0000000000

5.6227534596099014299621205097345503863500979597423M-1 -
8.2695008030983880283977294736486523245762587597828M-1 i
Argument (degrees) = 304.2132995871 Magnitude = 1.0000000000

6.0841871477566846066363839927203369324878351094250M-1 -
7.9361619660307071428516009633646003346672793824489M-1 i
Argument (degrees) = 307.4752533639 Magnitude = 1.0000000000

6.5257375089087743980495867513151732482004036120308M-1 -
7.5772521381316791696705295169504561605123095285393M-1 i
Argument (degrees) = 310.7359339089 Magnitude = 1.0000000000

6.9459663579459146231437398966206793525392798951870M-1 -
7.1939941169202777053923317857568336359998028114402M-1 i
Argument (degrees) = 313.9950830064 Magnitude = 1.0000000000

7.3435058055976593550033506921361658608227329829845M-1 -
6.7877037710225298317517702186235266142473393822064M-1 i
Argument (degrees) = 317.2523694625 Magnitude = 1.0000000000

7.7170630731941418214400566118602312880136978870617M-1 -
6.3597906824315678344566008338164208572465113787067M-1 i
Argument (degrees) = 320.5073619898 Magnitude = 1.0000000000

8.0654252704344731006123437087686748356900966351223M-1 -
5.9117607535350249870723145063306137439520682566400M-1 i
Argument (degrees) = 323.7594894368 Magnitude = 1.0000000000

8.3874642704983468236362304836972441753960019860919M-1 -
5.4452220442433414824633996180976755710273214894656M-1 i
Argument (degrees) = 327.0079811994 Magnitude = 1.0000000000

8.6821419462527311918105585002614559778401191908691M-1 -
4.9618959305006425054871556672060109260722597594539M-1 i
Argument (degrees) = 330.2517759199 Magnitude = 1.0000000000

8.9485162923226569325793812511409229762364342462491M-1 -
4.4636371006205207743797282550359953458839976653750M-1 i
Argument (degrees) = 333.4893784003 Magnitude = 1.0000000000

9.1857495053149539008219089245732097848700185901142M-1 -
3.9524683459334724566761957481125737863021754036198M-1 i
Argument (degrees) = 336.7186306100 Magnitude = 1.0000000000

9.3931202847645706068228202284694428765078311286551M-1 -
3.4306400737973594644687179206982153575868743243547M-1 i
Argument (degrees) = 339.9363397014 Magnitude = 1.0000000000

9.5700452680022113764915763383217281219333819810395M-1 -

2.9007298337467559182690002608579701114467563910869M-1 i
 Argument (degrees) = 343.1376745196 Magnitude = 1.0000000000

9.7161203652866932858507356101060374997443715114579M-1 -
 2.3657990293474156019426855839264460870028553777594M-1 i
 Argument (degrees) = 346.3152290420 Magnitude = 1.0000000000

9.8312044132836315303369104925086834653224371841508M-1 -
 1.8295955247629040714982572594048878828326512490631M-1 i
 Argument (degrees) = 349.4578069481 Magnitude = 1.0000000000

9.9155814022616680310583219985510562864493128759553M-1 -
 1.2966284954151412877284775314245092006018074610638M-1 i
 Argument (degrees) = 352.5498898777 Magnitude = 1.0000000000

9.9702014614548326696111375450097692483096919833276M-1 -
 7.7141611209769191899416525627412226856836620369904M-2 i
 Argument (degrees) = 355.5757158058 Magnitude = 1.0000000000

9.9967321455670056134902604545041320486417389626361M-1 -
 2.5562943842071962962738854745906182463945832923492M-2 i
 Argument (degrees) = 358.5351916431 Magnitude = 1.0000000000

All roots lie on the unit circle within error 0.0000000E+00