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MATH446

**Project 2: MATLAB Results**

**fpi.m**

g=@(x) sqrt((10+6\*x+2\*x^3-5\*exp(x/2))/7);

x(1)=3;steps=50;

for i=1:steps

x(i+1)=g(x(i));

end

r=x(steps+1);

e=x-r;

for i=1:steps

rat(i+1)=e(i+1)/e(i);

end

rat(1)=0;

[x' e' rat']

**STEP1:**

**For the first equation: sqrt((10+6\*x+2\*x^3-5\*exp(x/2))/7)**

>> fpi

ans =

1.500000000000000 0.085559233703731 0

1.471879261203980 0.057438494907711 0.671330170003691

1.452657939381976 0.038217173085706 0.665358191350791

1.439712500852949 0.025271734556680 0.661266454742870

1.431082369096465 0.016641602800195 0.658506552562572

1.425368722653018 0.010927956356748 0.656664895079686

1.421603439196521 0.007162672900252 0.655444866947020

1.419129742457556 0.004688976161286 0.654640554802041

1.417507881907974 0.003067115611704 0.654112007868045

1.416445940401088 0.002005174104818 0.653765413069683

1.415751224672308 0.001310458376038 0.653538449798144

1.415297006644042 0.000856240347772 0.653389961427696

1.415000142012630 0.000559375716361 0.653292872516714

1.414806166968715 0.000365400672445 0.653229415860856

1.414679441613000 0.000238675316730 0.653187951552854

1.414596659671896 0.000155893375627 0.653160862054980

1.414542586989133 0.000101820692864 0.653143165668953

1.414507268608916 0.000066502312647 0.653131605928973

1.414484200556354 0.000043434260084 0.653124054721960

1.414469134042059 0.000028367745790 0.653119121505076

1.414459293722025 0.000018527425756 0.653115897656483

1.414452866813512 0.000012100517242 0.653113789334270

1.414448669294225 0.000007902997956 0.653112408136514

1.414445927835116 0.000005161538847 0.653111499654325

1.414444137353533 0.000003371057263 0.653110896445814

1.414442967969122 0.000002201672852 0.653110487360346

1.414442204231260 0.000001437934991 0.653110197233352

1.414441705425951 0.000000939129682 0.653109972228086

1.414441379651041 0.000000613354772 0.653109771234764

1.414441166884133 0.000000400587863 0.653109557221737

1.414441027923925 0.000000261627655 0.653109290242394

1.414440937167625 0.000000170871356 0.653108922643212

1.414440877893785 0.000000111597515 0.653108384410908

1.414440839181452 0.000000072885183 0.653107577069180

1.414440813898046 0.000000047601776 0.653106355257401

1.414440797385203 0.000000031088933 0.653104484540794

1.414440786600503 0.000000020304233 0.653101632802346

1.414440779556909 0.000000013260639 0.653097258652212

1.414440774956668 0.000000008660398 0.653090577157376

1.414440771952205 0.000000005655936 0.653080341298138

1.414440769989961 0.000000003693692 0.653064644802537

1.414440768708400 0.000000002412131 0.653040662861456

1.414440767871400 0.000000001575131 0.653003809533629

1.414440767324747 0.000000001028478 0.652947422226696

1.414440766967723 0.000000000671453 0.652861458626368

1.414440766734547 0.000000000438277 0.652729188940187

1.414440766582257 0.000000000285988 0.652527453041683

1.414440766482796 0.000000000186526 0.652216852035171

1.414440766417836 0.000000000121567 0.651739978739082

1.414440766375410 0.000000000079141 0.651007238528038

1.414440766347702 0.000000000051432 0.649883002541959

1.414440766329605 0.000000000033335 0.648141432456936

1.414440766317786 0.000000000021516 0.645451578309321

1.414440766310066 0.000000000013797 0.641231772633925

1.414440766305025 0.000000000008755 0.634591863010171

1.414440766301732 0.000000000005463 0.623925337932084

1.414440766299582 0.000000000003312 0.606373465571905

1.414440766298178 0.000000000001908 0.576015551682531

1.414440766297260 0.000000000000991 0.519259862678925

1.414440766296661 0.000000000000391 0.395114298520843

1.414440766296270 0 0

**For the second equation: (10-5\*exp(x/2))/(7\*x-2\*x^2-6)**

>> fpi

ans =

0 0.582354782862457 0

-0.833333333333333 -0.250978550470877 -0.430971905540534

-0.507009845722521 0.075344937139935 -0.300204686809195

-0.608119519838022 -0.025764736975565 -0.341957110239712

-0.573904584590433 0.008450198272023 -0.327975336213887

-0.585165255568414 -0.002810472705958 -0.332592516232755

-0.581424346726855 0.000930436135601 -0.331060370602020

-0.582663285697927 -0.000308502835470 -0.331567985878869

-0.582252545109478 0.000102237752978 -0.331399718975979

-0.582388670126680 -0.000033887264224 -0.331455487201072

-0.582343551369162 0.000011231493295 -0.331437003023187

-0.582358505463742 -0.000003722601286 -0.331443129423663

-0.582353549039396 0.000001233823061 -0.331441098904225

-0.582355191802958 -0.000000408940501 -0.331441771844929

-0.582354647322583 0.000000135539873 -0.331441548903597

-0.582354827786012 -0.000000044923556 -0.331441622874325

-0.582354767972922 0.000000014889535 -0.331441598280661

-0.582354787797468 -0.000000004935011 -0.331441597884065

-0.582354781226789 0.000000001635668 -0.331441601615095

-0.582354783404585 -0.000000000542128 -0.331441611730244

-0.582354782682773 0.000000000179684 -0.331441622966259

-0.582354782922011 -0.000000000059555 -0.331441398524143

-0.582354782842718 0.000000000019739 -0.331443027025415

-0.582354782868999 -0.000000000006542 -0.331435995792860

-0.582354782860288 0.000000000002168 -0.331443990021552

-0.582354782863175 -0.000000000000719 -0.331473042854949

-0.582354782862218 0.000000000000238 -0.331325301204819

-0.582354782862535 -0.000000000000079 -0.331002331002331

-0.582354782862431 0.000000000000026 -0.329577464788732

-0.582354782862465 -0.000000000000009 -0.329059829059829

-0.582354782862454 0.000000000000003 -0.337662337662338

-0.582354782862457 -0.000000000000001 -0.307692307692308

-0.582354782862456 0.000000000000000 -0.375000000000000

-0.582354782862457 -0.000000000000000 -0.333333333333333

-0.582354782862456 0.000000000000000 -1.000000000000000

-0.582354782862457 0 0

**For the third equation: (5\*exp(x/2)+7\*x^2-10)/(2\*x^2+6)**

>> fpi

ans =

3.000000000000000 -0.346992474822112 0

3.142018556320430 -0.204973918501683 0.590715745656339

3.230331758123700 -0.116660716698412 0.569149077849407

3.282047969124908 -0.064944505697205 0.556695583013580

3.311290819653333 -0.035701655168779 0.549725566243179

3.327503424561705 -0.019489050260408 0.545886462918137

3.336394539899663 -0.010597934922450 0.543789193462116

3.341241522627242 -0.005750952194870 0.542648377910686

3.343875290606496 -0.003117184215616 0.542029234462514

3.345303916021003 -0.001688558801110 0.541693619726035

3.346078100283124 -0.000914374538989 0.541511813736044

3.346497420228766 -0.000495054593347 0.541413362071526

3.346724472038462 -0.000268002783650 0.541360058571756

3.346847396553088 -0.000145078269025 0.541331202045094

3.346913941694617 -0.000078533127495 0.541315581052436

3.346949964280642 -0.000042510541471 0.541307125117711

3.346969463757706 -0.000023011064406 0.541302547795063

3.346980018931340 -0.000012455890773 0.541300069940798

3.346985732464276 -0.000006742357837 0.541298728451300

3.346988825197288 -0.000003649624825 0.541298001869459

3.346990499288925 -0.000001975533187 0.541297607829855

3.346991405471149 -0.000001069350964 0.541297392863172

3.346991895985351 -0.000000578836762 0.541297273991439

3.346992161499391 -0.000000313322721 0.541297204789716

3.346992305221414 -0.000000169600698 0.541297157697123

3.346992383017744 -0.000000091804369 0.541297116555035

3.346992425128678 -0.000000049693435 0.541297056383503

3.346992447923207 -0.000000026898905 0.541296963823851

3.346992460261821 -0.000000014560292 0.541296809774322

3.346992466940677 -0.000000007881435 0.541296510779226

3.346992470555923 -0.000000004266190 0.541296044595568

3.346992472512845 -0.000000002309267 0.541295077709555

3.346992473572122 -0.000000001249991 0.541293205702760

3.346992474145505 -0.000000000676607 0.541289765373505

3.346992474455876 -0.000000000366236 0.541283578719650

3.346992474623879 -0.000000000198234 0.541273034385000

3.346992474714818 -0.000000000107295 0.541252691074705

3.346992474764043 -0.000000000058070 0.541215863844441

3.346992474790688 -0.000000000031424 0.541147589877716

3.346992474805112 -0.000000000017001 0.541004225491443

3.346992474812919 -0.000000000009194 0.540776343973669

3.346992474817145 -0.000000000004968 0.540334267220558

3.346992474819433 -0.000000000002680 0.539424280350438

3.346992474820671 -0.000000000001442 0.538117335101094

3.346992474821341 -0.000000000000772 0.535263319987681

3.346992474821704 -0.000000000000409 0.529919447640967

3.346992474821900 -0.000000000000213 0.520086862106406

3.346992474822006 -0.000000000000106 0.498956158663883

3.346992474822064 -0.000000000000048 0.456066945606695

3.346992474822096 -0.000000000000017 0.348623853211009

3.346992474822113 0 0

**STEP 2**

**EQ1:**

>> f=@(x) (6\*x^2-(5\*exp(x/2)/2)+6)/(2\*sqrt(7)\*(sqrt(2\*x^3+6\*x-5\*exp(x/2)+10)))

>> f(1.4144407663)

ans =

0.653109842567786

**EQ2:**

>> f=@(x) -(((10-5\*exp(x/2))\*(7-4\*x))/(-2\*x^2+7\*x-6)^2)-(5\*exp(x/2)/(2\*(-2\*x^2+7\*x-6)))

>> f(-0.5823547828)

ans =

-0.331441604363550

**EQ3:**

>> f=@(x) (5\*exp(x/2)\*(x^2-4\*x+3)+124\*x)/(4\*(x^2+3)^2)

>> f(3.3469924748)

ans =

0.541297146509449