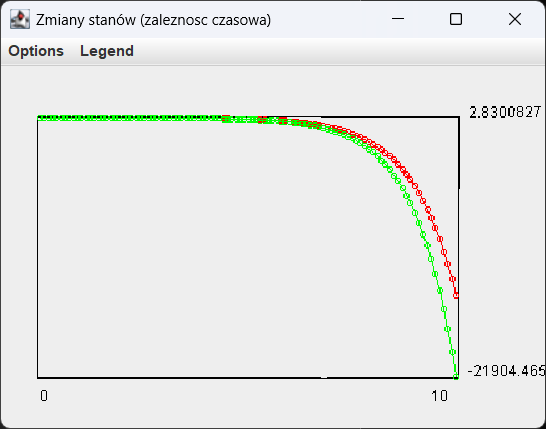
## Dla kroku 0.1

A screen shot of a graph

Description automatically generated

Real | Euler | RK4 | Euler diff | RK4 diff   
-----------------------------------------------------------------------------------------------------------------------------  
2.8300826865077675 | 2.816052608272801 | 2.8160508812562113 | -0.014030078234966492 | 1.7270165897365075E-6   
2.8240909551585442 | 2.8069675756048857 | 2.8069658216546114 | -0.017123379553658502 | 1.7539502743524338E-6   
2.8055297150070615 | 2.790352535587055 | 2.790350882480328 | -0.015177179420006404 | 1.6531067270619815E-6   
2.7825000506743987 | 2.7683109296619355 | 2.7683091874827297 | -0.014189121012463168 | 1.7421792057881191E-6   
2.7550270136427835 | 2.7241055577207307 | 2.7241040350831858 | -0.030921455922052754 | 1.5226375449373108E-6   
2.6997500557418386 | 2.704800033155327 | 2.7047983343293653 | 0.005049977413488449 | 1.6988259616823598E-6   
2.6827518305843485 | 2.620703332380756 | 2.620701702372739 | -0.062048498203592484 | 1.6300080170061904E-6   
2.5925016641675898 | 2.6109439010693505 | 2.61094257653958 | 0.018442236901760722 | 1.3245297703079473E-6   
2.569725061316022 | 2.5198830772634526 | 2.5198815362989033 | -0.049841984052569455 | 1.5409645492958646E-6   
2.4877287856068997 | 2.4438300874323495 | 2.4438290414330615 | -0.043898698174550166 | 1.0459992880740288E-6   
2.385697567447624 | 2.4058339760535667 | 2.4058325398853753 | 0.02013640860594279 | 1.4361681914820679E-6   
2.371571623279 | 2.2817181715409554 | 2.2817168521174707 | -0.08985345173804449 | 1.3194234846913844E-6   
2.24688329389 | 2.214986500565878 | 2.2149858282447776 | -0.03189679332412165 | 6.72321100569917E-7   
2.140267324192386 | 2.15039688884305 | 2.150395694889527 | 0.010129564650664058 | 1.1939535231597631E-6   
2.1162575399 | 2.014459071507532 | 2.014458009031358 | -0.10179846839246798 | 1.0624761737076938E-6   
1.982052309 | 1.915817545185277 | 1.9158173586228042 | -0.06623476381472293 | 1.8656247280368632E-7   
1.84641119 | 1.8762472925295235 | 1.8762463652584855 | 0.02983610252952351 | 9.272710379537585E-7   
1.8252940566116242 | 1.7378811996094912 | 1.7378804093712379 | -0.08741285700213308 | 7.9023825327873E-7   
1.7112829 | 1.6012787292998718 | 1.6012780763497991 | -0.11000417070012825 | 6.529500726770721E-7   
1.5784390000000001 | 1.5368236193583975 | 1.5368240500769632 | -0.04161538064160264 | -4.30718565702648E-7   
1.4494900000000002 | 1.4681753023587296 | 1.4681747856626683 | 0.01868530235872945 | 5.166960612701388E-7   
1.4318234622727863 | 1.3401411924239968 | 1.3401408099013365 | -0.09168226984878958 | 3.825226602138798E-7   
1.3259 | 1.21859724183983 | 1.2185969905720486 | -0.10730275816016999 | 2.5126778147033235E-7   
1.209 | 1.1048290819243523 | 1.1048289583333333 | -0.10417091807564782 | 1.2359101897452263E-7   
1.1 | 1.067506039296525 | 1.0675072411102655 | -0.0324939607034751 | -1.2018137405256368E-6   
1.0 | 1.0 | 1.0 | 0.0 | 0.0   
0.9500058085000644 | 0.49626196499830577 | 0.4962641172471993 | -0.45374384350175867 | -2.152248893549924E-6   
0.36900638935007035 | -0.18973172487283918 | -0.1897284136551488 | -0.5587381142229095 | -3.3112176903715707E-6   
-0.32309297171492324 | -1.0046467710970575 | -1.0046420590262728 | -0.6815537993821342 | -4.7120707846737275E-6   
-1.1394022688864163 | -1.9641453694430737 | -1.9641389765757824 | -0.8247431005566574 | -6.392867291316051E-6   
-2.0943424957750585 | -3.0855369231876786 | -3.085528526191405 | -0.9911944274126201 | -8.396996273418722E-6   
-3.203776745352565 | -4.3879512814416515 | -4.387940507564728 | -1.1841745360890865 | -1.0773876923053649E-5   
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-5.957669861876605 | -7.622638920657909 | -7.622622042107587 | -1.6649690587813044 | -1.68785503218416E-5   
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-116.70722518287461 | -141.83224187515071 | -141.83187619816007 | -25.125016692276105 | -3.656769906399404E-4   
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-316.91278384511617 | -394.44777008251435 | -394.44656586689086 | -77.53498623739819 | -0.0012042156234883805   
-352.32506222962775 | -439.9090410932532 | -439.90767265458334 | -87.58397886362548 | -0.0013684386698855633   
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-656.0117789085816 | -836.0072916504101 | -836.004386751449 | -179.99551274182852 | -0.002904898961105573   
-726.2369567994398 | -928.8647156050172 | -928.8614293180879 | -202.6277588055774 | -0.0032862869293239783   
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-1325.7349085345725 | -1734.7924144560434 | -1734.7855962596605 | -409.0575059214709 | -0.006818196382937458   
-1463.9333993880298 | -1923.2358951040953 | -1923.2282068229524 | -459.30249571606555 | -0.00768828114291864   
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-1783.642013259516 | -2362.1619776244697 | -2362.1522132956707 | -578.5199643649537 | -0.00976432879906497   
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-4732.880556225708 | -6537.2040062777805 | -6537.172380499382 | -1804.323450052073 | -0.031625778398847615   
-5213.912611848278 | -7232.963539155876 | -7232.928025275152 | -2019.0509273075977 | -0.03551388072355621   
-5743.224873033106 | -8002.0839275752505 | -8002.044057550028 | -2258.859054542145 | -0.03987002522262628   
-6325.647360336417 | -8852.28270348236 | -8852.237953827613 | -2526.635343145944 | -0.04474965474764758   
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-7671.606406007064 | -10830.929208164991 | -10830.872873849044 | -3159.322802157927 | -0.056334315946514835   
-8447.41604660777 | -11979.220730216768 | -11979.157544469143 | -3531.804683608998 | -0.06318574762553908   
-9300.993651268547 | -13248.476829661628 | -13248.405974427249 | -3947.4831783930804 | -0.07085523437854135   
-10240.118016395401 | -14651.421565576999 | -14651.342126512742 | -4411.303549181597 | -0.07943906425680325   
-11273.34581803494 | -16202.117198015123 | -16202.028153284858 | -4928.771379980182 | -0.08904473026450432   
-12410.089399838434 | -17916.104927828164 | -17916.005135605956 | -5506.01552798973 | -0.09979222220863448   
-13660.702339822277 | -19810.560438229895 | -19810.44862276358 | -6149.858098407618 | -0.11181546631632955   
-15036.573573804504 | -21904.465794806274 | -21904.34053087681 | -6867.89222100177 | -0.12526392946529086

Różnice końcowe:

Euler: -6867.89222100177

RK4: -0.12526392946529086

## Dla kroku 0.5

A screen shot of a graph

Description automatically generated A screen shot of a computer

Description automatically generated

Real | Euler | RK4 | Euler diff | RK4 diff   
-----------------------------------------------------------------------------------------------------------------------------  
2.90625 | 2.7683109296619355 | 2.767131288846334 | -0.13793907033806452 | 0.0011796408156015126   
2.6875 | 2.6109439010693505 | 2.6096200672909617 | -0.07655609893064952 | 0.0013238337783887388   
2.359375 | 2.281718171540955 | 2.2809295654296875 | -0.07765682845904509 | 7.886061112674092E-4   
2.125 | 1.6012787292998718 | 1.6009114583333333 | -0.5237212707001282 | 3.672709665385465E-4   
1.5 | 1.0675060392965285 | 1.0667695380082782 | -0.43249396070347146 | 7.36501288250313E-4   
1.0 | 1.0 | 1.0 | 0.0 | 0.0   
0.4140625 | -3.0855369231876644 | -3.0839450063561444 | -3.4995994231876644 | -0.001591916831519935   
-3.87890625 | -11.865451958692304 | -11.857779138081872 | -7.986545708692304 | -0.007672820610432396   
-11.943359375 | -28.59815003314423 | -28.576755714598505 | -16.65479065814423 | -0.021394318545723934   
-25.9150390625 | -58.7671313005218 | -58.71702178995014 | -32.8520922380218 | -0.05010951057165869   
-48.99755859375 | -111.41315910257657 | -111.30566352353759 | -62.41560050882657 | -0.10749557903898221   
-85.996337890625 | -201.44193226422033 | -201.22326825624816 | -115.44559437359533 | -0.21866400797216556   
-144.1195068359375 | -353.428793492735 | -352.9995541828257 | -209.3092866567975 | -0.42923930990929193   
-234.17926025390625 | -607.8916330443616 | -607.0702286399184 | -373.71237279045533 | -0.8214044044432285   
-372.3938903808594 | -1031.6331584284583 | -1030.091027940282 | -659.2392680475989 | -1.5421304881763263   
-583.0908355712891 | -1734.7924144560625 | -1731.939767411975 | -1151.7015788847734 | -2.852647044087462   
-902.7612533569336 | -2898.957987041727 | -2893.743158259844 | -1996.1967336847933 | -5.214828781882716   
-1386.1418800354004 | -4823.5188402991325 | -4814.0772634856285 | -3437.376960263732 | -9.44157681350407   
-2115.3378200531006 | -8002.08392757538 | -7985.126061943757 | -5886.746107522279 | -16.957865631622553   
-3213.506730079651 | -13248.476829661866 | -13218.224081277078 | -10034.970099582215 | -30.252748384787992

Różnice końcowe:

Euler: -10034.970099582215

RK4: -30.252748384787992

## Dla kroku 0.01

A screen shot of a graph

Description automatically generated A screen shot of a graph

Description automatically generated

Różnice końcowe:

Euler: -857.728600611681

RK4: -1.3634053175337613E-5