Euler and Heun methods

dC/dt = -k\*C

t=0 C=10

k=2

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| t | dC/dt | Ceuler | analytical solution | Cheun | predicted slope | error Euler | error Heun |
| 0 | -20 | 10 | 10 | 10 | -1.8 | 0 | 0 |
| 0.1 | -16 | 8 | 8.187307531 | 8.2 | -1.476 | -0.18731 | 0.012692 |
| 0.2 | -12.8 | 6.4 | 6.70320046 | 6.724 | -1.21032 | -0.3032 | 0.0208 |
| 0.3 | -10.24 | 5.12 | 5.488116361 | 5.51368 | -0.99246 | -0.36812 | 0.025564 |
| 0.4 | -8.192 | 4.096 | 4.493289641 | 4.521218 | -0.81382 | -0.39729 | 0.027928 |
| 0.5 | -6.5536 | 3.2768 | 3.678794412 | 3.707398 | -0.66733 | -0.40199 | 0.028604 |
| 0.6 | -5.24288 | 2.62144 | 3.011942119 | 3.040067 | -0.54721 | -0.3905 | 0.028125 |
| 0.7 | -4.1943 | 2.097152 | 2.465969639 | 2.492855 | -0.44871 | -0.36882 | 0.026885 |
| 0.8 | -3.35544 | 1.677722 | 2.01896518 | 2.044141 | -0.36795 | -0.34124 | 0.025176 |
| 0.9 | -2.68435 | 1.342177 | 1.652988882 | 1.676196 | -0.30172 | -0.31081 | 0.023207 |
| 1 | -2.14748 | 1.073742 | 1.353352832 | 1.37448 | -0.24741 | -0.27961 | 0.021127 |
| 1.1 | -1.71799 | 0.858993 | 1.108031584 | 1.127074 | -0.20287 | -0.24904 | 0.019042 |
| 1.2 | -1.37439 | 0.687195 | 0.907179533 | 0.924201 | -0.16636 | -0.21998 | 0.017021 |
| 1.3 | -1.09951 | 0.549756 | 0.742735782 | 0.757844 | -0.13641 | -0.19298 | 0.015109 |
| 1.4 | -0.87961 | 0.439805 | 0.608100626 | 0.621432 | -0.11186 | -0.1683 | 0.013332 |
| 1.5 | -0.70369 | 0.351844 | 0.497870684 | 0.509575 | -0.09172 | -0.14603 | 0.011704 |
| 1.6 | -0.56295 | 0.281475 | 0.40762204 | 0.417851 | -0.07521 | -0.12615 | 0.010229 |
| 1.7 | -0.45036 | 0.22518 | 0.3337327 | 0.342638 | -0.06167 | -0.10855 | 0.008905 |
| 1.8 | -0.36029 | 0.180144 | 0.273237224 | 0.280963 | -0.05057 | -0.09309 | 0.007726 |
| 1.9 | -0.28823 | 0.144115 | 0.223707719 | 0.23039 | -0.04147 | -0.07959 | 0.006682 |
| 2 | -0.23058 | 0.115292 | 0.183156389 | 0.18892 | -0.03401 | -0.06786 | 0.005763 |
| 2.1 | -0.18447 | 0.092234 | 0.149955768 | 0.154914 | -0.02788 | -0.05772 | 0.004958 |
| 2.2 | -0.14757 | 0.073787 | 0.122773399 | 0.12703 | -0.02287 | -0.04899 | 0.004256 |
| 2.3 | -0.11806 | 0.05903 | 0.100518357 | 0.104164 | -0.01875 | -0.04149 | 0.003646 |
| 2.4 | -0.09445 | 0.047224 | 0.08229747 | 0.085415 | 1.393967 | -0.03507 | 0.003117 |