Supplementary Material for Artificial Neural Network Model for Thermal Conductivity Estimation of Metal Oxide Water-Based Nanofluids

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table S1: Input Parameters and Thermal Conductivity Dataset for ANN Training | | | | | |
| **Source** | **Nanomaterial**  **K (W/m°C)** | **Particle size (nm)** | **Conc. Wt. (%)** | **Temperature (°C)** | **k (W/m°C): output** |
| 1 | 8.4 | 21 | 0.84 | 15 | 0.6 |
| 1 | 8.4 | 21 | 0.84 | 25 | 0.61 |
| 1 | 8.4 | 21 | 0.84 | 35 | 0.6156 |
| 1 | 8.4 | 21 | 2.5 | 15 | 0.607 |
| 1 | 8.4 | 21 | 2.5 | 25 | 0.617 |
| 1 | 8.4 | 21 | 2.5 | 35 | 0.6256 |
| 1 | 8.4 | 21 | 4.1 | 15 | 0.611 |
| 1 | 8.4 | 21 | 4.1 | 25 | 0.619 |
| 1 | 8.4 | 21 | 4.1 | 35 | 0.6277 |
| 1 | 8.4 | 21 | 6 | 15 | 0.62 |
| 1 | 8.4 | 21 | 6 | 25 | 0.6325 |
| 1 | 8.4 | 21 | 6 | 35 | 0.6383 |
| 1 | 8.4 | 21 | 7.97 | 15 | 0.63 |
| 1 | 8.4 | 21 | 7.97 | 25 | 0.6378 |
| 1 | 8.4 | 21 | 7.97 | 35 | 0.6457 |
| 2 | 8.4 | 20 | 0.01 | 25 | 0.607 |
| 2 | 8.4 | 20 | 0.01 | 35 | 0.624 |
| 2 | 8.4 | 20 | 0.01 | 45 | 0.639 |
| 2 | 8.4 | 20 | 0.01 | 55 | 0.655 |
| 2 | 8.4 | 20 | 0.01 | 65 | 0.6695 |
| 2 | 8.4 | 20 | 0.05 | 25 | 0.609 |
| 2 | 8.4 | 20 | 0.05 | 35 | 0.627 |
| 2 | 8.4 | 20 | 0.05 | 45 | 0.6425 |
| 2 | 8.4 | 20 | 0.05 | 55 | 0.658 |
| 2 | 8.4 | 20 | 0.05 | 65 | 0.6725 |
| 2 | 8.4 | 20 | 0.1 | 25 | 0.611 |
| 2 | 8.4 | 20 | 0.1 | 35 | 0.629 |
| 2 | 8.4 | 20 | 0.1 | 45 | 0.644 |
| 2 | 8.4 | 20 | 0.1 | 55 | 0.66 |
| 2 | 8.4 | 20 | 0.1 | 65 | 0.675 |
| 2 | 8.4 | 20 | 0.5 | 25 | 0.613 |
| 2 | 8.4 | 20 | 0.5 | 35 | 0.631 |
| 2 | 8.4 | 20 | 0.5 | 45 | 0.647 |
| 2 | 8.4 | 20 | 0.5 | 55 | 0.663 |
| 2 | 8.4 | 20 | 0.5 | 65 | 0.677 |
| 2 | 8.4 | 20 | 1 | 25 | 0.614 |
| 2 | 8.4 | 20 | 1 | 35 | 0.633 |
| 2 | 8.4 | 20 | 1 | 45 | 0.6506 |
| 2 | 8.4 | 20 | 1 | 55 | 0.665 |
| 2 | 8.4 | 20 | 1 | 65 | 0.6793 |
| 3 | 8.4 | 12 | 0.127 | 10 | 0.6065 |
| 3 | 8.4 | 12 | 0.127 | 20 | 0.6104 |
| 3 | 8.4 | 12 | 0.127 | 30 | 0.6235 |
| 3 | 8.4 | 12 | 0.127 | 40 | 0.63141361 |
| 3 | 8.4 | 12 | 0.127 | 50 | 0.64581152 |
| 3 | 8.4 | 12 | 0.127 | 60 | 0.65366492 |
| 3 | 8.4 | 12 | 0.127 | 70 | 0.66413613 |
| 3 | 8.4 | 12 | 0.127 | 80 | 0.67460733 |
| 3 | 8.4 | 12 | 0.127 | 90 | 0.68507853 |
| 3 | 8.4 | 12 | 0.25 | 10 | 0.6117801 |
| 3 | 8.4 | 12 | 0.25 | 20 | 0.61832461 |
| 3 | 8.4 | 12 | 0.25 | 30 | 0.62879581 |
| 3 | 8.4 | 12 | 0.25 | 40 | 0.64057592 |
| 3 | 8.4 | 12 | 0.25 | 50 | 0.65366492 |
| 3 | 8.4 | 12 | 0.25 | 60 | 0.65890052 |
| 3 | 8.4 | 12 | 0.25 | 70 | 0.67329843 |
| 3 | 8.4 | 12 | 0.25 | 80 | 0.68507853 |
| 3 | 8.4 | 12 | 0.25 | 90 | 0.69293194 |
| 3 | 8.4 | 12 | 0.5 | 10 | 0.62879581 |
| 3 | 8.4 | 12 | 0.5 | 20 | 0.63534031 |
| 3 | 8.4 | 12 | 0.5 | 30 | 0.64319372 |
| 3 | 8.4 | 12 | 0.5 | 40 | 0.65366492 |
| 3 | 8.4 | 12 | 0.5 | 50 | 0.66413613 |
| 3 | 8.4 | 12 | 0.5 | 60 | 0.67460733 |
| 3 | 8.4 | 12 | 0.5 | 70 | 0.68900524 |
| 3 | 8.4 | 12 | 0.5 | 80 | 0.70078534 |
| 3 | 8.4 | 12 | 0.5 | 90 | 0.71649215 |
| 3 | 8.4 | 12 | 1 | 10 | 0.65366492 |
| 3 | 8.4 | 12 | 1 | 20 | 0.66151832 |
| 3 | 8.4 | 12 | 1 | 30 | 0.67591623 |
| 3 | 8.4 | 12 | 1 | 40 | 0.68507853 |
| 3 | 8.4 | 12 | 1 | 50 | 0.69031414 |
| 3 | 8.4 | 12 | 1 | 60 | 0.70732984 |
| 3 | 8.4 | 12 | 1 | 70 | 0.72434555 |
| 3 | 8.4 | 12 | 1 | 80 | 0.72958115 |
| 3 | 8.4 | 12 | 1 | 90 | 0.75183246 |
| 3 | 8.4 | 12 | 1.5 | 10 | 0.67722513 |
| 3 | 8.4 | 12 | 1.5 | 20 | 0.70732984 |
| 3 | 8.4 | 12 | 1.5 | 30 | 0.72303665 |
| 3 | 8.4 | 12 | 1.5 | 40 | 0.72434555 |
| 3 | 8.4 | 12 | 1.5 | 50 | 0.74397906 |
| 3 | 8.4 | 12 | 1.5 | 60 | 0.75575916 |
| 3 | 8.4 | 12 | 1.5 | 70 | 0.77931937 |
| 3 | 8.4 | 12 | 2 | 10 | 0.72172775 |
| 3 | 8.4 | 12 | 2 | 20 | 0.74397906 |
| 3 | 8.4 | 12 | 2 | 30 | 0.77277487 |
| 3 | 8.4 | 12 | 2 | 40 | 0.78455497 |
| 3 | 8.4 | 12 | 2 | 50 | 0.81335079 |
| 3 | 8.4 | 12 | 2 | 60 | 0.83167539 |
| 3 | 8.4 | 12 | 2 | 70 | 0.8473822 |
| 4 | 8.4 | 20 | 1 | 20 | 0.6063 |
| 4 | 8.4 | 20 | 1 | 30 | 0.622 |
| 4 | 8.4 | 20 | 1 | 40 | 0.6456 |
| 4 | 8.4 | 20 | 1 | 50 | 0.6891 |
| 4 | 8.4 | 20 | 1 | 60 | 0.7097 |
| 4 | 8.4 | 20 | 1 | 70 | 0.7308 |
| 4 | 8.4 | 20 | 10 | 20 | 0.6191 |
| 4 | 8.4 | 20 | 10 | 30 | 0.6368 |
| 4 | 8.4 | 20 | 10 | 40 | 0.6586 |
| 4 | 8.4 | 20 | 10 | 50 | 0.6937 |
| 4 | 8.4 | 20 | 10 | 60 | 0.7132 |
| 4 | 8.4 | 20 | 10 | 70 | 0.7738 |
| 4 | 8.4 | 20 | 20 | 30 | 0.6773 |
| 5 | 8.4 | 10 | 3.85 | 20 | 0.61146067 |
| 5 | 8.4 | 10 | 3.85 | 30 | 0.62898876 |
| 5 | 8.4 | 10 | 3.85 | 40 | 0.63707865 |
| 5 | 8.4 | 10 | 7.41 | 20 | 0.62460674 |
| 5 | 8.4 | 10 | 7.41 | 30 | 0.63842697 |
| 5 | 8.4 | 10 | 7.41 | 40 | 0.65426966 |
| 5 | 8.4 | 10 | 10.71 | 20 | 0.63370787 |
| 5 | 8.4 | 10 | 10.71 | 30 | 0.65089888 |
| 5 | 8.4 | 10 | 10.71 | 40 | 0.67247191 |
| 7 | 8.4 | 40 | 2.5 | 10 | 0.58665352 |
| 7 | 8.4 | 40 | 5 | 10 | 0.59677596 |
| 7 | 8.4 | 40 | 10 | 10 | 0.61206733 |
| 7 | 8.4 | 40 | 5 | 30 | 0.6364 |
| 7 | 8.4 | 40 | 10 | 30 | 0.647 |
| 7 | 8.4 | 40 | 2.5 | 40 | 0.63472249 |
| 7 | 8.4 | 40 | 5 | 40 | 0.65159682 |
| 7 | 8.4 | 40 | 10 | 40 | 0.66920353 |
| 8 | 8.4 | 15 | 0.02 | 25 | 0.6552375 |
| 8 | 8.4 | 15 | 0.034 | 25 | 0.6931125 |
| 8 | 8.4 | 15 | 0.04 | 25 | 0.739825 |
| 8 | 8.4 | 15 | 0.085 | 25 | 0.76696875 |
| 8 | 8.4 | 15 | 0.12 | 25 | 0.780225 |
| 8 | 8.4 | 15 | 0.17 | 25 | 0.7941125 |
| 8 | 8.4 | 15 | 0.21 | 25 | 0.80484375 |
| 8 | 8.4 | 50 | 2 | 25 | 0.61393172 |
| 8 | 8.4 | 50 | 3 | 25 | 0.6179619 |
| 8 | 8.4 | 50 | 4 | 25 | 0.62326033 |
| 8 | 8.4 | 50 | 5 | 25 | 0.62931936 |
| 8 | 8.4 | 50 | 6 | 25 | 0.63309571 |
| 8 | 8.4 | 50 | 8 | 25 | 0.63810934 |
| 8 | 8.4 | 50 | 11.6 | 25 | 0.64864252 |
| 9 | 8.4 | 50 | 2 | 30 | 0.6261512 |
| 9 | 8.4 | 50 | 3 | 30 | 0.63074805 |
| 9 | 8.4 | 50 | 4 | 30 | 0.63611729 |
| 9 | 8.4 | 50 | 5 | 30 | 0.64225631 |
| 9 | 8.4 | 50 | 6 | 30 | 0.64711121 |
| 9 | 8.4 | 50 | 8 | 30 | 0.65604688 |
| 9 | 8.4 | 50 | 11.6 | 30 | 0.66749237 |
| 9 | 8.4 | 50 | 2 | 35 | 0.64005245 |
| 9 | 8.4 | 50 | 3 | 35 | 0.64834318 |
| 9 | 8.4 | 50 | 4 | 35 | 0.65273233 |
| 9 | 8.4 | 50 | 5 | 35 | 0.65894222 |
| 9 | 8.4 | 50 | 6 | 35 | 0.66385159 |
| 9 | 8.4 | 50 | 8 | 35 | 0.67237156 |
| 9 | 8.4 | 50 | 11.6 | 35 | 0.68264438 |
| 9 | 8.4 | 50 | 2 | 40 | 0.65252794 |
| 9 | 8.4 | 50 | 3 | 40 | 0.66249035 |
| 9 | 8.4 | 50 | 4 | 40 | 0.66956024 |
| 9 | 8.4 | 50 | 5 | 40 | 0.67741834 |
| 9 | 8.4 | 50 | 6 | 40 | 0.6847486 |
| 9 | 8.4 | 50 | 8 | 40 | 0.69520497 |
| 9 | 8.4 | 50 | 11.6 | 40 | 0.70585929 |
| 9 | 8.4 | 50 | 2 | 45 | 0.66831234 |
| 9 | 8.4 | 50 | 3 | 45 | 0.6757252 |
| 9 | 8.4 | 50 | 4 | 45 | 0.68686433 |
| 9 | 8.4 | 50 | 5 | 45 | 0.69507509 |
| 9 | 8.4 | 50 | 6 | 45 | 0.70115901 |
| 9 | 8.4 | 50 | 8 | 45 | 0.7112 |
| 9 | 8.4 | 50 | 11.6 | 45 | 0.72702468 |
| 9 | 8.4 | 50 | 2 | 50 | 0.67920305 |
| 9 | 8.4 | 50 | 3 | 50 | 0.68881969 |
| 9 | 8.4 | 50 | 4 | 50 | 0.69870621 |
| 9 | 8.4 | 50 | 5 | 50 | 0.70778764 |
| 9 | 8.4 | 50 | 6 | 50 | 0.71311436 |
| 9 | 8.4 | 50 | 8 | 50 | 0.72189229 |
| 9 | 8.4 | 50 | 11.6 | 50 | 0.74025595 |
| 10 | 8.4 | 22 | 2 | 30 | 0.639174 |
| 10 | 8.4 | 22 | 4 | 30 | 0.643472 |
| 10 | 8.4 | 22 | 6 | 30 | 0.648384 |
| 10 | 8.4 | 22 | 8 | 30 | 0.654524 |
| 10 | 8.4 | 22 | 9.8 | 30 | 0.655138 |
| 10 | 8.4 | 22 | 11.6 | 30 | 0.658208 |
| 10 | 8.4 | 10 | 4 | 30 | 0.627 |
| 10 | 8.4 | 10 | 8 | 30 | 0.54 |
| 10 | 8.4 | 10 | 11.6 | 30 | 0.676 |
| 10 | 8.4 | 34 | 4 | 30 | 0.624 |
| 10 | 8.4 | 34 | 8 | 30 | 0.645 |
| 10 | 8.4 | 34 | 11.6 | 30 | 0.66 |
| 10 | 8.4 | 70 | 4 | 30 | 0.619 |
| 10 | 8.4 | 70 | 8 | 30 | 0.633 |
| 10 | 8.4 | 70 | 11.6 | 30 | 0.646 |
| 11 | 40 | 20 | 10 | 10 | 0.6198895 |
| 11 | 40 | 20 | 10 | 30 | 0.65414365 |
| 11 | 40 | 20 | 10 | 50 | 0.68839779 |
| 11 | 40 | 20 | 20 | 30 | 0.67955801 |
| 11 | 40 | 20 | 20 | 50 | 0.71270718 |
| 12 | 40 | 38 | 1.2 | 25 | 0.613 |
| 12 | 40 | 38 | 2 | 25 | 0.615 |
| 12 | 40 | 38 | 3 | 25 | 0.618 |
| 12 | 40 | 38 | 5.7 | 25 | 0.63 |
| 12 | 40 | 38 | 7.5 | 25 | 0.639 |
| 12 | 40 | 38 | 11 | 25 | 0.656 |
| 12 | 40 | 50 | 0.4 | 20 | 0.61306667 |
| 12 | 40 | 50 | 2 | 20 | 0.62266667 |
| 12 | 40 | 50 | 4 | 20 | 0.63013333 |
| 12 | 40 | 50 | 4.6 | 20 | 0.63866667 |
| 12 | 40 | 50 | 7.5 | 20 | 0.644 |
| 12 | 40 | 50 | 0.4 | 30 | 0.63013333 |
| 12 | 40 | 50 | 2 | 30 | 0.6376 |
| 12 | 40 | 50 | 4 | 30 | 0.644 |
| 12 | 40 | 50 | 4.6 | 30 | 0.64933333 |
| 12 | 40 | 50 | 7.5 | 30 | 0.65573333 |
| 12 | 40 | 50 | 0.4 | 40 | 0.644 |
| 12 | 40 | 50 | 2 | 40 | 0.6504 |
| 12 | 40 | 50 | 4 | 40 | 0.66106667 |
| 12 | 40 | 50 | 4.6 | 40 | 0.6696 |
| 12 | 40 | 50 | 7.5 | 40 | 0.6728 |
| 12 | 40 | 50 | 0.4 | 50 | 0.6632 |
| 12 | 40 | 50 | 2 | 50 | 0.6696 |
| 12 | 40 | 50 | 4 | 50 | 0.676 |
| 12 | 40 | 50 | 4.6 | 50 | 0.6824 |
| 12 | 40 | 50 | 7.5 | 50 | 0.692 |
| 12 | 40 | 50 | 0.4 | 60 | 0.68026667 |
| 12 | 40 | 50 | 2 | 60 | 0.68986667 |
| 12 | 40 | 50 | 4 | 60 | 0.69733333 |
| 12 | 40 | 50 | 4.6 | 60 | 0.7016 |
| 12 | 40 | 50 | 7.5 | 60 | 0.70586667 |
| 12 | 40 | 50 | 0.4 | 20 | 0.60928545 |
| 12 | 40 | 50 | 2 | 20 | 0.61289152 |
| 12 | 40 | 50 | 4 | 20 | 0.62090337 |
| 12 | 40 | 50 | 4.6 | 20 | 0.62675305 |
| 12 | 40 | 50 | 7.5 | 20 | 0.63152906 |
| 12 | 40 | 50 | 0.4 | 30 | 0.62550167 |
| 12 | 40 | 50 | 2 | 30 | 0.63234358 |
| 12 | 40 | 50 | 4 | 30 | 0.63711218 |
| 12 | 40 | 50 | 4.6 | 30 | 0.64296927 |
| 12 | 40 | 50 | 7.5 | 30 | 0.64881896 |
| 12 | 40 | 50 | 0.4 | 40 | 0.64171788 |
| 12 | 40 | 50 | 2 | 40 | 0.64640504 |
| 12 | 40 | 50 | 4 | 40 | 0.65440948 |
| 12 | 40 | 50 | 4.6 | 40 | 0.65918549 |
| 12 | 40 | 50 | 7.5 | 40 | 0.66719733 |
| 12 | 40 | 50 | 0.4 | 50 | 0.65685302 |
| 12 | 40 | 50 | 2 | 50 | 0.66478341 |
| 12 | 40 | 50 | 4 | 50 | 0.67279526 |
| 12 | 40 | 50 | 4.6 | 50 | 0.6754017 |
| 12 | 40 | 50 | 7.5 | 50 | 0.68342096 |
| 12 | 40 | 50 | 0.4 | 60 | 0.67306923 |
| 12 | 40 | 50 | 2 | 60 | 0.67775639 |
| 12 | 40 | 50 | 4 | 60 | 0.68359867 |
| 12 | 40 | 50 | 4.6 | 60 | 0.68837468 |
| 12 | 40 | 50 | 7.5 | 60 | 0.69315068 |
| 13 | 40 | 20 | 0.01 | 15.5 | 0.61320153 |
| 13 | 40 | 20 | 0.02 | 15.5 | 0.62325473 |
| 13 | 40 | 20 | 0.04 | 15.5 | 0.64528587 |
| 13 | 40 | 20 | 0.08 | 15.2 | 0.67278759 |
| 13 | 40 | 20 | 0.1 | 15.5 | 0.70336853 |
| 13 | 40 | 20 | 0.01 | 26 | 0.61517778 |
| 13 | 40 | 20 | 0.02 | 26 | 0.62256667 |
| 13 | 40 | 20 | 0.04 | 26 | 0.63945556 |
| 13 | 40 | 20 | 0.08 | 26 | 0.67534444 |
| 13 | 40 | 20 | 0.1 | 26 | 0.70173333 |
| 13 | 40 | 20 | 0.15 | 26 | 0.72970556 |
| 13 | 40 | 20 | 0.2 | 26 | 0.76559444 |
| 13 | 40 | 20 | 0.01 | 35 | 0.62833125 |
| 13 | 40 | 20 | 0.02 | 35 | 0.63695625 |
| 13 | 40 | 20 | 0.04 | 35 | 0.65905781 |
| 13 | 40 | 20 | 0.08 | 35 | 0.70218281 |
| 13 | 40 | 20 | 0.1 | 35 | 0.72644063 |
| 13 | 40 | 20 | 0.15 | 35 | 0.75393281 |
| 13 | 40 | 20 | 0.2 | 35 | 0.79112813 |
| 13 | 40 | 20 | 0.01 | 45 | 0.64406042 |
| 13 | 40 | 20 | 0.02 | 45 | 0.65951875 |
| 13 | 40 | 20 | 0.04 | 45 | 0.69485208 |
| 13 | 40 | 20 | 0.08 | 45 | 0.73791458 |
| 13 | 40 | 20 | 0.1 | 45 | 0.75889375 |
| 13 | 40 | 20 | 0.15 | 45 | 0.7969875 |
| 13 | 40 | 20 | 0.2 | 45 | 0.83121667 |
| 13 | 40 | 20 | 0.01 | 50 | 0.64811111 |
| 13 | 40 | 20 | 0.02 | 50 | 0.66644444 |
| 13 | 40 | 20 | 0.04 | 50 | 0.70422222 |
| 13 | 40 | 20 | 0.08 | 50 | 0.75255556 |
| 13 | 40 | 20 | 0.1 | 50 | 0.79533333 |
| 13 | 40 | 20 | 0.15 | 50 | 0.812 |
| 13 | 40 | 20 | 0.2 | 50 | 0.84755556 |
| 14 | 40 | 50 | 0.4 | 19 | 0.60209406 |
| 14 | 40 | 50 | 0.4 | 23 | 0.61874226 |
| 14 | 40 | 50 | 0.4 | 27 | 0.62571087 |
| 14 | 40 | 50 | 0.4 | 29 | 0.63280982 |
| 14 | 40 | 50 | 0.4 | 34 | 0.64697296 |
| 14 | 40 | 50 | 0.4 | 37 | 0.65636581 |
| 14 | 40 | 50 | 0.4 | 43 | 0.66322146 |
| 14 | 40 | 50 | 0.4 | 47 | 0.67736722 |
| 14 | 40 | 50 | 0.4 | 53 | 0.6793657 |
| 14 | 40 | 50 | 0.4 | 57 | 0.69598784 |
| 14 | 40 | 25 | 4 | 15 | 0.59722353 |
| 14 | 40 | 25 | 4 | 25 | 0.64224118 |
| 14 | 40 | 25 | 4 | 35 | 0.66650956 |
| 14 | 40 | 25 | 4 | 45 | 0.69975588 |
| 14 | 40 | 25 | 4 | 55 | 0.74955 |
| 14 | 40 | 25 | 11 | 15 | 0.62532647 |
| 14 | 40 | 25 | 11 | 25 | 0.68308676 |
| 14 | 40 | 25 | 11 | 35 | 0.71445441 |
| 14 | 40 | 25 | 11 | 45 | 0.75743235 |
| 15 | 40 | 25 | 17.25 | 25 | 0.72764559 |
| 15 | 40 | 15 | 0.5 | 15 | 0.59785297 |
| 15 | 40 | 15 | 0.5 | 25 | 0.62696432 |
| 15 | 40 | 15 | 0.5 | 35 | 0.65322486 |
| 15 | 40 | 15 | 0.5 | 45 | 0.67759784 |
| 15 | 40 | 15 | 0.5 | 55 | 0.71025081 |
| 15 | 40 | 15 | 1 | 15 | 0.61565189 |
| 15 | 40 | 15 | 1 | 25 | 0.65448 |
| 15 | 40 | 15 | 1 | 35 | 0.68276432 |
| 15 | 40 | 15 | 1 | 45 | 0.70922595 |
| 15 | 40 | 15 | 1 | 55 | 0.73748757 |
| 16 | 40 | 30 | 1.5 | 10 | 0.6005814 |
| 16 | 40 | 30 | 1.5 | 15 | 0.60755814 |
| 16 | 40 | 30 | 1.5 | 20 | 0.61976744 |
| 16 | 40 | 30 | 1.5 | 25 | 0.62151163 |
| 16 | 40 | 30 | 1.5 | 30 | 0.63459302 |
| 16 | 40 | 30 | 1.5 | 35 | 0.64418605 |
| 16 | 40 | 30 | 1.5 | 40 | 0.65290698 |
| 16 | 40 | 30 | 3 | 10 | 0.62238372 |
| 16 | 40 | 30 | 3 | 15 | 0.63284884 |
| 16 | 40 | 30 | 3 | 20 | 0.64069767 |
| 16 | 40 | 30 | 3 | 25 | 0.6502907 |
| 16 | 40 | 30 | 3 | 30 | 0.65377907 |
| 16 | 40 | 30 | 3 | 35 | 0.66773256 |
| 16 | 40 | 30 | 3 | 40 | 0.67732558 |
| 16 | 40 | 30 | 5 | 10 | 0.64680233 |
| 16 | 40 | 30 | 5 | 15 | 0.65639535 |
| 16 | 40 | 30 | 5 | 20 | 0.66598837 |
| 16 | 40 | 30 | 5 | 25 | 0.67645349 |
| 16 | 40 | 30 | 5 | 30 | 0.68517442 |
| 16 | 40 | 30 | 5 | 35 | 0.69476744 |
| 16 | 40 | 30 | 5 | 40 | 0.70348837 |
| 17 | 40 | 9 | 1.5 | 25 | 0.61585332 |
| 17 | 40 | 9 | 1.5 | 30 | 0.62319332 |
| 17 | 40 | 9 | 1.5 | 35 | 0.63961589 |
| 17 | 40 | 9 | 1.5 | 40 | 0.65521112 |
| 17 | 40 | 9 | 1.5 | 45 | 0.66365204 |
| 17 | 40 | 9 | 2.7 | 25 | 0.63071571 |
| 17 | 40 | 9 | 2.7 | 30 | 0.64466038 |
| 17 | 40 | 9 | 2.7 | 35 | 0.65915718 |
| 17 | 40 | 9 | 2.7 | 40 | 0.67090085 |
| 17 | 40 | 9 | 2.7 | 45 | 0.68732176 |
| 18 | 40 | 18.7 | 0.04 | 20 | 0.60660202 |
| 18 | 40 | 18.7 | 0.04 | 30 | 0.61670403 |
| 18 | 40 | 18.7 | 0.04 | 40 | 0.61959032 |
| 18 | 40 | 18.7 | 0.04 | 50 | 0.62391976 |
| 18 | 40 | 18.7 | 0.08 | 20 | 0.64989637 |
| 18 | 40 | 18.7 | 0.08 | 30 | 0.65133952 |
| 18 | 40 | 18.7 | 0.08 | 40 | 0.65855524 |
| 18 | 40 | 18.7 | 0.08 | 50 | 0.66288468 |
| 18 | 40 | 18.7 | 0.2 | 20 | 0.67587298 |
| 18 | 40 | 18.7 | 0.2 | 30 | 0.70329274 |
| 18 | 40 | 18.7 | 0.2 | 40 | 0.70954637 |
| 18 | 40 | 18.7 | 0.2 | 50 | 0.71628105 |
| 21 | 40 | 40 | 3.84 | 40 | 0.6918048 |
| 22 | 13 | 10 | 5.37 | 25 | 0.637 |
| 22 | 13 | 10 | 10.3 | 25 | 0.665 |
| 22 | 13 | 20 | 5.37 | 25 | 0.627 |
| 22 | 13 | 20 | 10.3 | 25 | 0.65 |
| 22 | 13 | 20 | 14.8 | 25 | 0.677 |
| 22 | 13 | 30 | 5.37 | 25 | 0.618 |
| 22 | 13 | 30 | 10.3 | 25 | 0.637 |
| 22 | 13 | 30 | 14.8 | 25 | 0.651 |
| 22 | 13 | 40 | 0.5 | 20 | 0.60816216 |
| 22 | 13 | 40 | 0.5 | 25 | 0.61756757 |
| 22 | 13 | 40 | 0.5 | 30 | 0.62437838 |
| 22 | 13 | 40 | 0.5 | 35 | 0.63118919 |
| 22 | 13 | 40 | 0.5 | 40 | 0.63735135 |
| 22 | 13 | 40 | 0.5 | 45 | 0.64351351 |
| 22 | 13 | 40 | 0.5 | 50 | 0.64805405 |
| 22 | 13 | 40 | 1 | 20 | 0.61627027 |
| 22 | 13 | 40 | 1 | 25 | 0.626 |
| 22 | 13 | 40 | 1 | 30 | 0.63216216 |
| 22 | 13 | 40 | 1 | 35 | 0.63832432 |
| 22 | 13 | 40 | 1 | 40 | 0.64545946 |
| 22 | 13 | 40 | 1 | 45 | 0.65032432 |
| 22 | 13 | 40 | 1 | 50 | 0.65518919 |
| 22 | 13 | 40 | 2.42 | 20 | 0.62567568 |
| 22 | 13 | 40 | 2.42 | 25 | 0.63605405 |
| 22 | 13 | 40 | 2.42 | 30 | 0.64254054 |
| 22 | 13 | 40 | 2.42 | 35 | 0.64902703 |
| 22 | 13 | 40 | 2.42 | 40 | 0.65551351 |
| 22 | 13 | 40 | 2.42 | 45 | 0.66037838 |
| 22 | 13 | 40 | 2.42 | 50 | 0.66427027 |
| 22 | 13 | 40 | 0.5 | 25 | 0.60774011 |
| 22 | 13 | 40 | 0.5 | 30 | 0.61271186 |
| 22 | 13 | 40 | 0.5 | 35 | 0.62468927 |
| 22 | 13 | 40 | 0.5 | 40 | 0.62988701 |
| 22 | 13 | 40 | 0.5 | 45 | 0.6400565 |
| 22 | 13 | 40 | 0.5 | 50 | 0.65090395 |
| 22 | 13 | 40 | 1.11 | 25 | 0.60932203 |
| 22 | 13 | 40 | 1.11 | 30 | 0.6179096 |
| 22 | 13 | 40 | 1.11 | 35 | 0.6260452 |
| 22 | 13 | 40 | 1.11 | 40 | 0.63463277 |
| 22 | 13 | 40 | 1.11 | 45 | 0.64615819 |
| 22 | 13 | 40 | 1.11 | 50 | 0.65316384 |
| 22 | 13 | 40 | 2.42 | 25 | 0.61903955 |
| 22 | 13 | 40 | 2.42 | 30 | 0.62084746 |
| 22 | 13 | 40 | 2.42 | 35 | 0.63011299 |
| 22 | 13 | 40 | 2.42 | 40 | 0.63576271 |
| 22 | 13 | 40 | 2.42 | 45 | 0.65 |
| 22 | 13 | 40 | 2.42 | 50 | 0.66920904 |
| 23 | 13 | 53 | 0.2 | 30 | 0.63208943 |
| 23 | 13 | 53 | 0.2 | 40 | 0.64199874 |
| 23 | 13 | 53 | 0.2 | 50 | 0.65190805 |
| 23 | 13 | 53 | 0.2 | 60 | 0.6642507 |
| 23 | 13 | 53 | 0.2 | 70 | 0.67470055 |
| 23 | 13 | 53 | 0.4 | 30 | 0.63830565 |
| 23 | 13 | 53 | 0.4 | 40 | 0.65010685 |
| 23 | 13 | 53 | 0.4 | 50 | 0.65893598 |
| 23 | 13 | 53 | 0.4 | 60 | 0.67208853 |
| 23 | 13 | 53 | 0.4 | 70 | 0.68307803 |
| 23 | 13 | 53 | 0.6 | 30 | 0.64452186 |
| 23 | 13 | 53 | 0.6 | 40 | 0.65524288 |
| 23 | 13 | 53 | 0.6 | 50 | 0.66596211 |
| 23 | 13 | 53 | 0.6 | 60 | 0.67884529 |
| 23 | 13 | 53 | 0.6 | 70 | 0.69064649 |
| 23 | 13 | 53 | 0.8 | 30 | 0.65208943 |
| 23 | 13 | 53 | 0.8 | 40 | 0.66335099 |
| 23 | 13 | 53 | 0.8 | 50 | 0.67407111 |
| 23 | 13 | 53 | 0.8 | 60 | 0.68884439 |
| 23 | 13 | 53 | 0.8 | 70 | 0.69848433 |
| 23 | 13 | 53 | 1 | 30 | 0.66100745 |
| 23 | 13 | 53 | 1 | 40 | 0.67118883 |
| 23 | 13 | 53 | 1 | 50 | 0.68190716 |
| 23 | 13 | 53 | 1 | 60 | 0.69992637 |
| 23 | 13 | 53 | 1 | 70 | 0.70767442 |
| 24 | 13 | 50 | 2.74 | 25 | 0.61055118 |
| 24 | 13 | 50 | 5.5 | 25 | 0.63023622 |
| 24 | 13 | 50 | 7.9 | 25 | 0.65937008 |
| 24 | 13 | 50 | 10.3 | 25 | 0.67984252 |
| 25 | 33 | 31 | 3 | 25 | 0.60758182 |
| 25 | 33 | 31 | 6 | 25 | 0.64454303 |
| 25 | 33 | 31 | 8.8 | 25 | 0.65518657 |
| 25 | 33 | 31 | 11.5 | 25 | 0.66772108 |
| 25 | 33 | 31 | 14 | 25 | 0.6802676 |
| 25 | 33 | 23 | 3 | 25 | 0.62261364 |
| 25 | 33 | 23 | 6 | 25 | 0.65767186 |
| 25 | 33 | 23 | 8.8 | 25 | 0.67019437 |
| 25 | 33 | 23 | 11.5 | 25 | 0.69402676 |
| 26 | 33 | 40 | 0.62 | 20 | 0.59351351 |
| 26 | 33 | 40 | 0.62 | 30 | 0.61027027 |
| 26 | 33 | 40 | 0.62 | 40 | 0.62216216 |
| 26 | 33 | 40 | 0.62 | 50 | 0.64594595 |
| 26 | 33 | 40 | 0.62 | 60 | 0.66540541 |
| 26 | 33 | 40 | 0.62 | 70 | 0.68108108 |
| 26 | 33 | 40 | 0.62 | 80 | 0.69405405 |
| 26 | 33 | 40 | 1.5 | 20 | 0.59891892 |
| 26 | 33 | 40 | 1.5 | 30 | 0.61621622 |
| 26 | 33 | 40 | 1.5 | 40 | 0.63459459 |
| 26 | 33 | 40 | 1.5 | 50 | 0.65621622 |
| 26 | 33 | 40 | 1.5 | 60 | 0.67189189 |
| 26 | 33 | 40 | 1.5 | 70 | 0.70108108 |
| 26 | 33 | 40 | 1.5 | 80 | 0.72432432 |
| 26 | 33 | 40 | 3 | 20 | 0.6027027 |
| 26 | 33 | 40 | 3 | 30 | 0.62054054 |
| 26 | 33 | 40 | 3 | 40 | 0.64216216 |
| 26 | 33 | 40 | 3 | 50 | 0.66108108 |
| 26 | 33 | 40 | 3 | 60 | 0.68486486 |
| 26 | 33 | 40 | 3 | 70 | 0.70972973 |
| 26 | 33 | 50 | 0.62 | 20 | 0.59571429 |
| 26 | 33 | 50 | 0.62 | 30 | 0.61857143 |
| 26 | 33 | 50 | 0.62 | 40 | 0.63 |
| 26 | 33 | 50 | 0.62 | 50 | 0.64857143 |
| 26 | 33 | 50 | 0.62 | 60 | 0.66857143 |
| 26 | 33 | 50 | 0.62 | 70 | 0.68 |
| 26 | 33 | 50 | 0.62 | 80 | 0.69 |
| 26 | 33 | 50 | 1.5 | 20 | 0.59857143 |
| 26 | 33 | 50 | 1.5 | 30 | 0.62857143 |
| 26 | 33 | 50 | 1.5 | 40 | 0.64 |
| 26 | 33 | 50 | 1.5 | 50 | 0.65857143 |
| 26 | 33 | 50 | 1.5 | 60 | 0.67571429 |
| 26 | 33 | 50 | 1.5 | 70 | 0.7 |
| 26 | 33 | 50 | 3 | 20 | 0.60285714 |
| 26 | 33 | 50 | 3 | 30 | 0.63571429 |
| 26 | 33 | 50 | 3 | 40 | 0.64571429 |
| 26 | 33 | 50 | 3 | 50 | 0.66571429 |
| 26 | 33 | 50 | 3 | 60 | 0.68571429 |
| 26 | 33 | 50 | 3 | 70 | 0.71 |
| 27 | 33 | 50 | 0.1 | 25 | 0.636 |
| 27 | 33 | 50 | 0.1 | 30 | 0.642 |
| 27 | 33 | 50 | 0.1 | 35 | 0.651 |
| 27 | 33 | 50 | 0.1 | 40 | 0.662 |
| 28 | 17.65 | 30 | 0.5 | 20 | 0.64893262 |
| 28 | 17.65 | 30 | 0.5 | 25 | 0.6595854 |
| 28 | 17.65 | 30 | 0.5 | 35 | 0.69319289 |
| 28 | 17.65 | 30 | 0.5 | 45 | 0.71246333 |
| 28 | 17.65 | 30 | 0.5 | 55 | 0.72147399 |
| 28 | 17.65 | 30 | 1 | 20 | 0.67967691 |
| 28 | 17.65 | 30 | 1 | 25 | 0.7026246 |
| 28 | 17.65 | 30 | 1 | 35 | 0.73008463 |
| 28 | 17.65 | 30 | 1 | 45 | 0.76163595 |
| 28 | 17.65 | 30 | 1 | 55 | 0.78294853 |
| 28 | 17.65 | 30 | 2 | 20 | 0.75139721 |
| 28 | 17.65 | 30 | 2 | 25 | 0.77023958 |
| 28 | 17.65 | 30 | 2 | 35 | 0.81409985 |
| 28 | 17.65 | 30 | 2 | 45 | 0.83130711 |
| 28 | 17.65 | 30 | 2 | 55 | 0.84442308 |
| 28 | 17.65 | 30 | 5 | 20 | 0.84155988 |
| 28 | 17.65 | 30 | 5 | 25 | 0.87065503 |
| 28 | 17.65 | 30 | 5 | 35 | 0.94114023 |
| 28 | 17.65 | 13 | 1 | 20 | 0.65207547 |
| 28 | 17.65 | 13 | 1 | 25 | 0.6690566 |
| 28 | 17.65 | 13 | 1 | 30 | 0.68830189 |
| 28 | 17.65 | 13 | 1 | 35 | 0.70075472 |
| 28 | 17.65 | 13 | 1 | 40 | 0.71660377 |
| 28 | 17.65 | 13 | 1 | 45 | 0.73018868 |
| 28 | 17.65 | 13 | 1 | 50 | 0.73924528 |
| 28 | 17.65 | 13 | 1 | 55 | 0.74943396 |
| 28 | 17.65 | 13 | 1 | 60 | 0.76188679 |
| 28 | 17.65 | 13 | 2 | 20 | 0.6690566 |
| 28 | 17.65 | 13 | 2 | 25 | 0.69622642 |
| 28 | 17.65 | 13 | 2 | 30 | 0.71207547 |
| 28 | 17.65 | 13 | 2 | 35 | 0.73245283 |
| 28 | 17.65 | 13 | 2 | 40 | 0.74490566 |
| 28 | 17.65 | 13 | 2 | 45 | 0.75962264 |
| 28 | 17.65 | 13 | 2 | 50 | 0.76754717 |
| 28 | 17.65 | 13 | 2 | 55 | 0.77886792 |
| 28 | 17.65 | 13 | 2 | 60 | 0.80150943 |
| 28 | 17.65 | 13 | 3 | 20 | 0.68943396 |
| 28 | 17.65 | 13 | 3 | 25 | 0.70867925 |
| 28 | 17.65 | 13 | 3 | 30 | 0.73245283 |
| 28 | 17.65 | 13 | 3 | 35 | 0.74943396 |
| 28 | 17.65 | 13 | 3 | 40 | 0.76867925 |
| 28 | 17.65 | 13 | 3 | 45 | 0.79018868 |
| 28 | 17.65 | 13 | 3 | 50 | 0.81056604 |
| 28 | 17.65 | 13 | 3 | 55 | 0.82415094 |
| 28 | 17.65 | 13 | 3 | 60 | 0.84566038 |
| 28 | 17.65 | 13 | 4 | 20 | 0.71433962 |
| 28 | 17.65 | 13 | 4 | 25 | 0.74377358 |
| 28 | 17.65 | 13 | 4 | 30 | 0.76754717 |
| 28 | 17.65 | 13 | 4 | 35 | 0.79018868 |
| 28 | 17.65 | 13 | 4 | 40 | 0.81056604 |
| 28 | 17.65 | 13 | 4 | 45 | 0.83433962 |
| 28 | 17.65 | 13 | 4 | 50 | 0.84679245 |
| 28 | 17.65 | 13 | 4 | 55 | 0.85584906 |
| 28 | 17.65 | 13 | 4 | 60 | 0.88981132 |
| 28 | 17.65 | 13 | 5 | 20 | 0.7290566 |
| 28 | 17.65 | 13 | 5 | 25 | 0.75056604 |
| 28 | 17.65 | 13 | 5 | 30 | 0.7845283 |
| 28 | 17.65 | 13 | 5 | 35 | 0.81169811 |
| 28 | 17.65 | 13 | 5 | 40 | 0.83433962 |
| 28 | 17.65 | 13 | 5 | 45 | 0.85698113 |
| 28 | 17.65 | 13 | 5 | 50 | 0.86943396 |
| 28 | 17.65 | 13 | 5 | 55 | 0.89207547 |
| 28 | 17.65 | 13 | 5 | 60 | 0.9090566 |
| 28 | 17.65 | 13 | 7.5 | 20 | 0.73698113 |
| 28 | 17.65 | 13 | 7.5 | 25 | 0.76641509 |
| 28 | 17.65 | 13 | 7.5 | 30 | 0.79698113 |
| 28 | 17.65 | 13 | 7.5 | 35 | 0.82641509 |
| 28 | 17.65 | 13 | 7.5 | 40 | 0.85584906 |
| 28 | 17.65 | 13 | 7.5 | 45 | 0.87849057 |
| 28 | 17.65 | 13 | 7.5 | 50 | 0.9 |
| 28 | 17.65 | 13 | 7.5 | 55 | 0.91924528 |
| 28 | 17.65 | 13 | 9.5 | 20 | 0.75169811 |
| 28 | 17.65 | 13 | 9.5 | 25 | 0.78679245 |
| 28 | 17.65 | 13 | 9.5 | 30 | 0.80943396 |
| 28 | 17.65 | 13 | 9.5 | 35 | 0.83886792 |
| 28 | 17.65 | 13 | 9.5 | 40 | 0.86830189 |
| 28 | 17.65 | 13 | 9.5 | 45 | 0.89433962 |
| 28 | 17.65 | 13 | 9.5 | 50 | 0.91924528 |
| 28 | 17.65 | 13 | 9.5 | 55 | 0.94188679 |
| 28 | 17.65 | 20 | 1 | 20 | 0.6483871 |
| 28 | 17.65 | 20 | 1 | 25 | 0.66870968 |
| 28 | 17.65 | 20 | 1 | 30 | 0.67548387 |
| 28 | 17.65 | 20 | 1 | 35 | 0.67935484 |
| 28 | 17.65 | 20 | 1 | 40 | 0.69967742 |
| 28 | 17.65 | 20 | 1 | 45 | 0.71709677 |
| 28 | 17.65 | 20 | 1 | 50 | 0.72387097 |
| 28 | 17.65 | 20 | 1 | 55 | 0.72870968 |
| 28 | 17.65 | 20 | 1 | 60 | 0.74903226 |
| 28 | 17.65 | 20 | 2 | 20 | 0.66096774 |
| 28 | 17.65 | 20 | 2 | 25 | 0.69967742 |
| 28 | 17.65 | 20 | 2 | 30 | 0.71032258 |
| 28 | 17.65 | 20 | 2 | 35 | 0.71612903 |
| 28 | 17.65 | 20 | 2 | 40 | 0.73064516 |
| 28 | 17.65 | 20 | 2 | 45 | 0.74032258 |
| 28 | 17.65 | 20 | 2 | 50 | 0.7616129 |
| 28 | 17.65 | 20 | 2 | 55 | 0.78193548 |
| 28 | 17.65 | 20 | 2 | 60 | 0.80129032 |
| 28 | 17.65 | 20 | 3 | 20 | 0.68129032 |
| 28 | 17.65 | 20 | 3 | 25 | 0.71903226 |
| 28 | 17.65 | 20 | 3 | 30 | 0.72096774 |
| 28 | 17.65 | 20 | 3 | 35 | 0.73064516 |
| 28 | 17.65 | 20 | 3 | 40 | 0.75 |
| 28 | 17.65 | 20 | 3 | 45 | 0.76064516 |
| 28 | 17.65 | 20 | 3 | 50 | 0.77129032 |
| 28 | 17.65 | 20 | 3 | 55 | 0.79064516 |
| 28 | 17.65 | 20 | 3 | 60 | 0.81096774 |
| 28 | 17.65 | 20 | 4 | 20 | 0.71129032 |
| 28 | 17.65 | 20 | 4 | 25 | 0.74129032 |
| 28 | 17.65 | 20 | 4 | 30 | 0.75096774 |
| 28 | 17.65 | 20 | 4 | 35 | 0.76064516 |
| 28 | 17.65 | 20 | 4 | 40 | 0.77129032 |
| 28 | 17.65 | 20 | 4 | 45 | 0.7916129 |
| 28 | 17.65 | 20 | 4 | 50 | 0.80129032 |
| 28 | 17.65 | 20 | 4 | 55 | 0.81193548 |
| 28 | 17.65 | 20 | 4 | 60 | 0.82258065 |
| 28 | 17.65 | 20 | 1.3 | 30 | 0.646041 |
| 28 | 17.65 | 20 | 2.5 | 30 | 0.65300128 |
| 28 | 17.65 | 20 | 3.72 | 30 | 0.659788 |
| 28 | 17.65 | 20 | 5 | 30 | 0.66171479 |
| 28 | 17.65 | 20 | 7.22 | 30 | 0.6683446 |
| 28 | 17.65 | 20 | 9.5 | 30 | 0.67653653 |
| 28 | 17.65 | 20 | 11.6 | 30 | 0.67969627 |
| 28 | 17.65 | 20 | 13.65 | 30 | 0.68424412 |
| 28 | 17.65 | 20 | 5 | 10 | 0.59362572 |
| 28 | 17.65 | 20 | 5 | 20 | 0.63230938 |
| 28 | 17.65 | 20 | 5 | 40 | 0.68329523 |
| 28 | 17.65 | 20 | 10 | 20 | 0.63565333 |
| 28 | 17.65 | 20 | 10 | 40 | 0.70437133 |
| 28 | 17.65 | 20 | 14 | 20 | 0.64021515 |
| 28 | 17.65 | 20 | 14 | 40 | 0.7222542 |
| 28 | 17.65 | 50 | 0.1 | 25 | 0.617 |
| 28 | 17.65 | 50 | 0.1 | 30 | 0.623 |
| 28 | 17.65 | 50 | 0.1 | 35 | 0.627 |
| 28 | 17.65 | 50 | 0.1 | 40 | 0.649 |