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| F1 - Ackley | |
|  |  |
| *f*(**x**)=−20exp(−0.2*d*1​∑*i*=1*d*​*xi*2​​)−exp(*d*1​∑*i*=1*d*​cos(2*πxi*​))+20+*e* | |
| ChatGPT | |

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| F2 - ChatGPTGenerated | |
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| f(x) = ​sin(*x*​)× *e*−*x*2​ | |
| ChatGPT | |

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| F3 - Rastrigin | |
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| *f*(**x**)=10*d*+∑*i*=1*d*​[*xi*2​−10cos(2*πxi*​)] | |
| ChatGPT | |

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| F4 - Schwefel | |
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| *f*(**x**)=418.9829*d*−∑*i*=1*d*​[*xi*​sin(∣*xi*​∣​)] | |
| ChatGPT | |

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| F5 - Levy | |
|  |  |
| *f*(**x**)=sin2(*πw*1​)+∑*i*=1*d*−1​(*wi*​−1)2[1+10sin2(*πwi*​+1)]+(*wd*​−1)2[1+sin2(2*πwd*​)] | |
| ChatGPT | |

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| F6 - Sphere | |
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| *f*(**x**)=∑*i*=1*d*​*xi*2​ | |
| ChatGPT | |

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| F7 – SchwefelNo226 | |
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| <https://al-roomi.org/benchmarks/unconstrained/n-dimensions/176-generalized-schwefel-s-problem-2-26> | |

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| F8 - ChungReynolds | |
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| <https://al-roomi.org/benchmarks/unconstrained/n-dimensions/165-chung-reynolds-function> | |

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| F9 - EggHolder | |
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| <https://al-roomi.org/benchmarks/unconstrained/n-dimensions/187-egg-holder-function> | |

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| F10 - Quartic | |
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| <https://al-roomi.org/benchmarks/unconstrained/n-dimensions/161-quartic-or-modified-4th-de-jong-s-function> | |

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| F11 - YaoLiu09 | |
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| f_{\text{YaoLiu09}}(\mathbf{x}) = \sum_{i=1}^n \left [ x_i^2 - 10 \cos(2 \pi x_i ) + 10 \right ] | |
| <https://infinity77.net/global_optimization/test_functions_nd_Y.html> | |

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| F12 - BentCigar | |
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| <https://al-roomi.org/benchmarks/unconstrained/n-dimensions/164-bent-cigar-function> | |
| F13 - Qing | |
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| <https://infinity77.net/global_optimization/test_functions_nd_Q.html> | |

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| F14 - Mishra11 | |
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| f_{\text{Mishra11}}(\mathbf{x}) = \left [ \frac{1}{n} \sum_{i=1}^{n} \lvert x_i \rvert - \left(\prod_{i=1}^{n} \lvert x_i \rvert \right )^{\frac{1}{n}} \right]^2 | |
| <https://infinity77.net/global_optimization/test_functions_nd_M.html> | |

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| F15 - Mishra07 | |
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| f_{\text{Mishra07}}(\mathbf{x}) = \left [\prod_{i=1}^{n} x_i - n! \right]^2 | |
| <https://infinity77.net/global_optimization/test_functions_nd_M.html> | |

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| F16 - DixonPrice | |
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| <https://www.sfu.ca/~ssurjano/dixonpr.html> | |

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| F17 - Alpine01 | |
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| f_{\text{Alpine01}}(\mathbf{x}) = \sum_{i=1}^{n} \lvert {x_i \sin \left( x_i \right) + 0.1 x_i} \rvert | |
| <https://infinity77.net/global_optimization/test_functions_nd_A.html#go_benchmark.Alpine01> | |

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| F18 - StyblinskiTang | |
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| <https://www.sfu.ca/~ssurjano/stybtang.html> | |

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| F19 - HyperEllipsoid | |
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| <https://al-roomi.org/benchmarks/unconstrained/n-dimensions/177-hyper-elipsoid-function> | |

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| F20 - DebsNo1 | |
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| <https://al-roomi.org/benchmarks/unconstrained/n-dimensions/231-deb-s-function-no-01> | |

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| F21 - Trid | |
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| <https://infinity77.net/global_optimization/test_functions_nd_T.html> | |

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| F22 - Rana | |
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| f_{\text{Rana}}(\mathbf{x}) = \sum_{i=1}^{n} \left[x_{i} \sin\left(\sqrt{\lvert{x_{1} - x_{i} + 1}\rvert}\right) \cos\left(\sqrt{\lvert{x_{1} + x_{i} + 1}\rvert}\right) + \left(x_{1} + 1\right) \sin\left(\sqrt{\lvert{x_{1} + x_{i} + 1}\rvert}\right) \cos\left(\sqrt{\lvert{x_{1} - x_{i} + 1}\rvert}\right)\right] | |
| <https://infinity77.net/global_optimization/test_functions_nd_R.html> | |

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| F23 - Plateau | |
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| f_{\text{Plateau}}(\mathbf{x}) = 30 + \sum_{i=1}^n \lfloor x_i \rfloor | |
| <https://infinity77.net/global_optimization/test_functions_nd_P.html> | |

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| F24 - CosineMixture | |
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| f_{\text{CosineMixture}}(\mathbf{x}) = -0.1 \sum_{i=1}^n \cos(5 \pi x_i) - \sum_{i=1}^n x_i^2 | |
| <https://infinity77.net/global_optimization/test_functions_nd_C.html> | |

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| F25 - Michalewicz | |
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| <https://www.sfu.ca/~ssurjano/michal.html> | |