The original data on per capita manganese consumption and per capita GDP in typical developed countries follow the "S-shaped curve" pattern.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Manganese consumption per capita in the United Kingdom | UK GDP per capita | Manganese consumption per capita in Germany | German GDP per capita | Manganese consumption per capita in Korea | GDP per capita in Korea |
| 3.721  | 6949  | 1.981  | 3739  | 0.717  | 1623  |
| 3.830  | 7126  | 2.168  | 4090  | 1.013  | 1789  |
| 4.729  | 7083  | 3.082  | 4446  | 1.133  | 2016  |
| 4.573  | 7326  | 2.929  | 4813  | 0.724  | 2143  |
| 3.792  | 7589  | 2.734  | 5162  | 1.034  | 2304  |
| 5.056  | 7830  | 4.117  | 5713  | 1.299  | 2422  |
| 3.795  | 7892  | 3.016  | 6101  | 2.038  | 2776  |
| 5.644  | 7978  | 4.458  | 6424  | 2.873  | 2962  |
| 4.863  | 7918  | 4.117  | 6676  | 2.534  | 3105  |
| 4.323  | 8195  | 4.474  | 7121  | 3.445  | 3420  |
| 5.793  | 8617  | 5.466  | 7644  | 3.869  | 3726  |
| 4.058  | 8848  | 4.262  | 7900  | 3.659  | 4030  |
| 4.085  | 8883  | 4.593  | 8172  | 3.873  | 4271  |
| 4.721  | 9169  | 4.631  | 8334  | 3.852  | 4109  |
| 5.555  | 9591  | 5.636  | 8767  | 5.068  | 4301  |
| 5.348  | 9773  | 5.258  | 9138  | 5.193  | 4548  |
| 4.883  | 9900  | 4.990  | 9337  | 3.640  | 4989  |
| 4.583  | 10064  | 4.346  | 9299  | 3.489  | 5340  |
| 4.178  | 10418  | 4.405  | 9730  | 3.192  | 5612  |
| 5.636  | 10559  | 6.599  | 10324  | 3.363  | 6174  |
| 6.270  | 10764  | 7.102  | 10768  | 5.253  | 6788  |
| 4.272  | 10948  | 5.202  | 11055  | 8.008  | 7451  |
| 5.220  | 11298  | 6.551  | 11492  | 8.827  | 7821  |
| 4.813  | 12035  | 6.525  | 12009  | 15.147  | 8458  |
| 5.135  | 11857  | 5.575  | 12116  | 8.765  | 9256  |
| 5.059  | 11836  | 5.103  | 12066  | 5.953  | 9780  |
| 5.392  | 12181  | 6.243  | 12673  | 8.931  | 10397  |
| 5.042  | 12483  | 6.136  | 13062  | 10.109  | 11295  |
| 4.294  | 13008  | 5.089  | 13454  | 11.500  | 12314  |
| 5.439  | 13489  | 7.067  | 14023  | 12.174  | 13172  |
| 2.643  | 13201  | 4.686  | 14207  | 11.635  | 13860  |
| 2.592  | 13083  | 3.914  | 14279  | 6.189  | 13020  |
| 1.952  | 13334  | 2.679  | 14171  | 12.791  | 14409  |
| 2.011  | 13884  | 3.096  | 14431  | 12.280  | 15605  |
| 1.631  | 14183  | 2.470  | 14838  | 12.137  | 16215  |
| 1.858  | 14759  | 2.759  | 15149  | 14.221  | 17326  |
| 1.863  | 15201  | 2.960  | 15451  | 16.171  | 17752  |
| 1.932  | 15978  | 2.678  | 15626  | 16.951  | 18549  |
| 1.944  | 16860  | 3.607  | 16068  | 16.877  | 19211  |
| 1.692  | 17256  | 3.215  | 16501  | 12.659  | 20138  |
| 1.428  | 17343  | 3.201  | 15931  | 11.220  | 21163  |
| 1.876  | 17109  | 3.452  | 16639  | 12.162  | 23732  |
| 1.656  | 17128  | 3.259  | 16874  | 10.832  | 24049  |
| 2.298  | 17519  | 4.477  | 16636  | 10.479  | 24516  |
| 1.801  | 18157  | 3.366  | 16980  | 12.511  | 25105  |
| 1.710  | 18557  | 3.335  | 17223  | 12.094  | 25584  |
| 1.841  | 18979  | 3.078  | 17326  | 8.475  | 26172  |
| 1.510  | 19735  | 2.687  | 17617  | 10.131  | 26868  |
| 1.844  | 20329  | 3.253  | 17947  | 11.016  | 27496  |
| 1.636  | 20912  | 2.952  | 18296  | 8.395  | 28170  |
| 1.650  | 21555  | 3.293  | 18839  | 8.845  | 27908  |
| 1.654  | 22077  | 3.159  | 19167  | 10.679  | 29038  |
| 1.651  | 22528  | 3.229  | 19184  |  |  |
| 1.390  | 23165  | 2.802  | 19070  |  |  |
| 2.180  | 23573  | 4.181  | 19312  |  |  |
| 1.448  | 24159  | 3.242  | 19462  |  |  |
| 2.137  | 24603  | 4.575  | 20191  |  |  |
| 2.034  | 25041  | 4.524  | 20847  |  |  |
| 1.513  | 24760  | 3.876  | 21064  |  |  |
| 0.578  | 23518  | 1.462  | 19870  |  |  |
| 1.404  | 23723  | 3.884  | 20665  |  |  |
| 1.373  | 23913  | 3.837  | 21395  |  |  |
| 1.385  | 24060  | 3.897  | 21468  |  |  |

The original data on per capita manganese consumption and per capita GDP in typical developed countries follow the "S-shaped curve" pattern.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Manganese consumption per capita in China | China's GDP per capita | Per capita consumption of manganese in Japan | Japan's GDP per capita | Manganese consumption per capita in the United States | United States GDP per capita |
| 0.624  | 3511  | 0.529  | 1908  | 6.474  | 9819  |
| 0.543  | 3776  | 0.711  | 2113  | 7.304  | 10445  |
| 0.902  | 4093  | 0.717  | 2324  | 6.349  | 10706  |
| 0.978  | 4476  | 0.875  | 2463  | 7.205  | 11027  |
| 1.387  | 4899  | 0.703  | 2572  | 4.551  | 10772  |
| 1.728  | 5425  | 0.968  | 2762  | 6.951  | 11331  |
| 2.424  | 6082  | 0.909  | 2940  | 4.919  | 11366  |
| 2.701  | 6910  | 1.697  | 3126  | 6.888  | 11404  |
| 3.113  | 7542  | 1.396  | 3279  | 5.084  | 11107  |
| 4.473  | 8211  | 1.763  | 3543  | 5.556  | 11660  |
| 5.096  | 9038  | 2.821  | 3971  | 5.545  | 11766  |
| 5.705  | 9858  | 3.076  | 4407  | 4.266  | 11872  |
| 5.603  | 10584  | 2.928  | 4755  | 4.876  | 12404  |
| 6.789  | 11354  | 3.782  | 5106  | 5.383  | 12752  |
| 6.574  | 12119  | 5.665  | 5639  | 5.874  | 13298  |
| 6.424  | 12891  | 10.705  | 5899  | 6.589  | 13981  |
| 6.331  | 13675  | 11.351  | 6462  | 6.412  | 14737  |
| 6.868  | 14527  | 14.841  | 7103  | 5.625  | 14989  |
| 7.106  | 15427  | 17.331  | 7917  | 5.313  | 15568  |
| 7.736  | 16329  | 19.452  | 8795  | 6.014  | 15883  |
| 7.860  | 16429  | 14.229  | 9615  | 5.990  | 15717  |
| 7.714  | 17716  | 14.046  | 9938  | 5.224  | 16028  |
| 8.584  | 18547  | 14.785  | 10631  | 6.042  | 16679  |
| 9.020  | 19425  | 16.284  | 11332  | 6.801  | 17444  |
|  |  | 16.886  | 11050  | 6.451  | 17187  |
|  |  | 16.902  | 11259  | 4.875  | 16990  |
|  |  | 12.321  | 11582  | 5.814  | 17738  |
|  |  | 10.650  | 12008  | 6.406  | 18371  |
|  |  | 8.635  | 12579  | 5.875  | 19171  |
|  |  | 8.564  | 13207  | 5.126  | 19546  |
|  |  | 8.417  | 13529  | 4.181  | 19262  |
|  |  | 8.278  | 14072  | 4.130  | 19531  |
|  |  | 8.229  | 14494  | 2.675  | 19013  |
|  |  | 6.015  | 14967  | 2.630  | 19720  |
|  |  | 6.361  | 15611  | 2.445  | 20982  |
|  |  | 6.225  | 16397  | 2.692  | 21691  |
|  |  | 6.545  | 16954  | 2.787  | 22277  |
|  |  | 5.771  | 17768  | 2.643  | 22884  |
|  |  | 5.855  | 19017  | 2.815  | 23659  |
|  |  | 6.493  | 19986  | 2.952  | 24318  |
|  |  | 7.138  | 21020  | 2.539  | 24524  |
|  |  | 7.071  | 21804  | 2.377  | 24216  |
|  |  | 7.087  | 22062  | 2.336  | 24777  |
|  |  | 6.320  | 22037  | 2.690  | 25172  |
|  |  | 5.729  | 22359  | 2.646  | 25906  |
|  |  | 5.833  | 23087  | 2.545  | 26335  |
|  |  | 6.225  | 23943  | 2.885  | 27070  |
|  |  | 6.873  | 24366  | 2.361  | 28018  |
|  |  | 7.273  | 24285  | 2.813  | 29038  |
|  |  | 6.571  | 24442  | 2.575  | 30205  |
|  |  | 6.428  | 25328  | 2.720  | 31251  |
|  |  | 6.198  | 25609  | 2.424  | 31373  |
|  |  | 6.389  | 25773  | 2.414  | 31732  |
|  |  | 6.300  | 26281  | 2.209  | 32448  |
|  |  | 5.419  | 26986  | 3.504  | 33469  |
|  |  | 5.664  | 27560  | 2.604  | 34409  |
|  |  | 5.985  | 28082  | 3.536  | 35143  |
|  |  | 6.325  | 28679  | 3.234  | 35545  |
|  |  | 6.556  | 28496  | 2.761  | 35244  |
|  |  | 4.792  | 27071  | 1.462  | 34123  |
|  |  | 5.866  | 28329  | 2.317  | 34780  |
|  |  | 5.765  | 28418  | 2.227  | 35090  |
|  |  | 5.840  | 28973  | 2.662  | 35636  |
|  |  | 6.234  | 29663  | 2.486  | 36048  |
|  |  |  |  | 2.602  | 36689  |
|  |  |  |  | 2.178  | 37508  |
|  |  |  |  | 1.666  | 37850  |
|  |  |  |  | 2.165  | 38447  |
|  |  |  |  | 2.388  | 39329  |
|  |  |  |  | 2.333  | 40092  |
|  |  |  |  | 1.548  | 38540  |
|  |  |  |  | 2.128  | 40598  |
|  |  |  |  | 2.631  | 41373  |