dataPureBFSyy = {498138, 101129, 47404, 46614, 24887, 24492, 43849, 61230, 21332, 20937, 1001807, 131942, 117721, 156434, 68736, 95203, 64391, 80587, 107449, 135892, 1785556, 645881, 543963, 354741, 466140, 250056, 276919, 244921, 352371, 371333, 5249612, 2527430, 2453954, 1232507, 369358, 381999, 341310, 346445, 835102, 502879, 16380102, 4996790, 2019021, 1065013, 1095035, 1042891, 1199325, 1812813, 1117948, 1002203, 50449451, 10635117, 12848494, 15177223, 13311475, 13310290, 15151545, 13209556, 11393187, 14713057, 211902387, 152960486, 177132247, 200924380, 167399785, 150194455, 164553167, 155088932, 178416110, 167318802, 2634719180, 2285672695, 2396775729, 2543122155, 2280792044, 2434949090, 2442000455, 2323558075, 2207597697, 2338486821, 39508600886, 39901100764, 40383445292, 39151426963, 41663136771, 38433490623, 41936982135, 36233867881, 39895316670, 39492600413}

{498138, 101129, 47404, 46614, 24887, 24492, 43849, 61230, 21332, 20937, 1001807, 131942, 117721, 156434, 68736, 95203, 64391, 80587, 107449, 135892, 1785556, 645881, 543963, 354741, 466140, 250056, 276919, 244921, 352371, 371333, 5249612, 2527430, 2453954, 1232507, 369358, 381999, 341310, 346445, 835102, 502879, 16380102, 4996790, 2019021, 1065013, 1095035, 1042891, 1199325, 1812813, 1117948, 1002203, 50449451, 10635117, 12848494, 15177223, 13311475, 13310290, 15151545, 13209556, 11393187, 14713057, 211902387, 152960486, 177132247, 200924380, 167399785, 150194455, 164553167, 155088932, 178416110, 167318802, 2634719180, 2285672695, 2396775729, 2543122155, 2280792044, 2434949090, 2442000455, 2323558075, 2207597697, 2338486821, 39508600886, 39901100764, 40383445292, 39151426963, 41663136771, 38433490623, 41936982135, 36233867881, 39895316670, 39492600413}

Table[2ⁱ, {i, 2, 4}, {j, 1, 10}]

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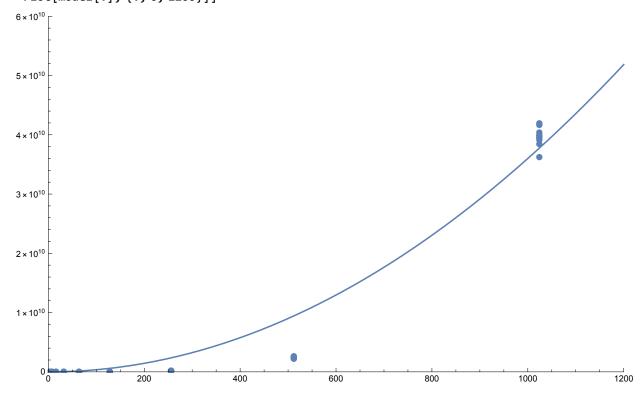
datapureBFS = Transpose@{dataPureBFSxx, dataPureBFSyy}

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{{4, 498138}, {4, 101129}, {4, 47404}, {4, 46614}, {4, 24887}, {4, 24492}, {4, 43849},
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{8, 156 434}, {8, 68 736}, {8, 95 203}, {8, 64 391}, {8, 80 587}, {8, 107 449}, {8, 135 892},
 \{16, 1785556\}, \{16, 645881\}, \{16, 543963\}, \{16, 354741\}, \{16, 466140\}, \{16, 250056\},
 \{16, 276919\}, \{16, 244921\}, \{16, 352371\}, \{16, 371333\}, \{32, 5249612\}, \{32, 2527430\},
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```

Clear[datapureBFS]

```
model[v_] = Fit[datapureBFS, {v^2}, v]
36002.6 v²
```

Show[ListPlot[datapureBFS, PlotRange \rightarrow {{0, 1200}, {0, 6 * 10^10}}], Plot[model[v], {v, 0, 1200}]]



dataPureDijyy = {540 803, 86 118, 45 034, 33 578, 45 824, 23 307, 20 542, 21 727, 27 653, 19 752, 819 301, 137 472, 95 598, 76 637, 71 107, 88 882, 97 969, 54 515, 56 884, 90 068, 1273 196, 310 497, 329 458, 368 172, 310 102, 336 174, 321 558, 331 039, 356 716, 127 596, 3 802 207, 2 293 175, 2 320 037, 1 563 547, 395 825, 454 685, 379 628, 493 793, 496 954, 686 965, 13 478 180, 4 818 234, 3 116 821, 619 019, 675 509, 695 260, 786 119, 636 005, 673 929, 592 552, 30 525 889, 3 240 072, 3 863 832, 3 889 508, 3 376 754, 3 463 662, 3 054 011, 3 193 458, 2 197 181, 1 843 230, 42 103 954, 18 672 091, 14 365 427, 13 313 450, 12 871 802, 14 978 125, 15 640 597, 17 451 040, 12 880 493, 14 824 062, 184 264 989, 163 151 980, 190 233 564, 177 188 343, 118 396 160, 152 584 019, 160 536 852, 143 978 984, 188 096 033, 141 488 688, 1782 492 074, 1604 431 101, 1723 792 726, 1603 504 745, 1551 822 787, 1586 039 484, 1608 260 565, 1588 239 825, 1565 340 865, 1593 274 144} {540 803, 86 118, 45 034, 33 578, 45 824, 23 307, 20 542, 21 727, 27 653, 19 752, 819 301, 133

{540 803, 86 118, 45 034, 33 578, 45 824, 23 307, 20 542, 21 727, 27 653, 19 752, 819 301, 137 472, 95 598, 76 637, 71 107, 88 882, 97 969, 54 515, 56 884, 90 068, 1 273 196, 310 497, 329 458, 368 172, 310 102, 336 174, 321 558, 331 039, 356 716, 127 596, 3 802 207, 2 293 175, 2 320 037, 1 563 547, 395 825, 454 685, 379 628, 493 793, 496 954, 686 965, 13 478 180, 4 818 234, 3 116 821, 619 019, 675 509, 695 260, 786 119, 636 005, 673 929, 592 552, 30 525 889, 3 240 072, 3 863 832, 3 889 508, 3 376 754, 3 463 662, 3 054 011, 3 193 458, 2 197 181, 1 843 230, 42 103 954, 18 672 091, 14 365 427, 13 313 450, 12 871 802, 14 978 125, 15 640 597, 17 451 040, 12 880 493, 14 824 062, 184 264 989, 163 151 980, 190 233 564, 177 188 343, 118 396 160, 152 584 019, 160 536 852, 143 978 984, 188 096 033, 141 488 688, 1782 492 074, 1604 431 101, 1723 792 726, 1603 504 745, 1551 822 787, 1586 039 484, 1608 260 565, 1588 239 825, 1565 340 865, 1593 274 144}

dataPureDijxx = dataPureBFSxx

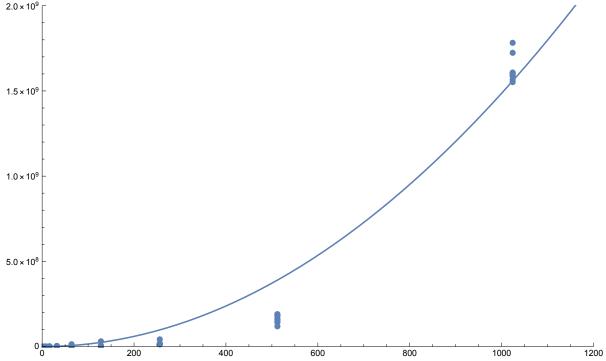
datapureDij = Transpose@{dataPureDijxx, dataPureDijyy}

{{4, 540 803}, {4, 86 118}, {4, 45 034}, {4, 33 578}, {4, 45 824}, {4, 23 307}, {4, 20 542}, {4, 21727}, {4, 27653}, {4, 19752}, {8, 819301}, {8, 137472}, {8, 95598}, {8, 76637}, $\{8,71107\},\{8,88882\},\{8,97969\},\{8,54515\},\{8,56884\},\{8,90068\},\{16,1273196\},$ $\{16, 310497\}, \{16, 329458\}, \{16, 368172\}, \{16, 310102\}, \{16, 336174\}, \{16, 321558\},$ {16, 331 039}, {16, 356 716}, {16, 127 596}, {32, 3 802 207}, {32, 2 293 175}, {32, 2 320 037}, {32, 1563547}, {32, 395825}, {32, 454685}, {32, 379628}, {32, 493793}, {32, 496954}, {32, 686 965}, {64, 13 478 180}, {64, 4 818 234}, {64, 3 116 821}, {64, 619 019}, {64, 675 509}, {64, 695 260}, {64, 786 119}, {64, 636 005}, {64, 673 929}, {64, 592 552}, {128, 30525889}, {128, 3240072}, {128, 3863832}, {128, 3889508}, {128, 3376754}, {128, 3463662}, {128, 3054011}, {128, 3193458}, {128, 2197181}, {128, 1843230}, {256, 42 103 954}, {256, 18 672 091}, {256, 14 365 427}, {256, 13 313 450}, {256, 12 871 802}, {256, 14 978 125}, {256, 15 640 597}, {256, 17 451 040}, {256, 12 880 493}, {256, 14 824 062}, {512, 184 264 989}, {512, 163 151 980}, {512, 190 233 564}, {512, 177 188 343}, {512, 118 396 160}, {512, 152 584 019}, {512, 160 536 852}, {512, 143 978 984}, {512, 188 096 033}, {512, 141 488 688}, {1024, 1782 492 074}, {1024, 1604 431 101}, {1024, 1723792726}, {1024, 1603504745}, {1024, 1551822787}, {1024, 1586039484}, {1024, 1608 260 565}, {1024, 1588 239 825}, {1024, 1565 340 865}, {1024, 1593 274 144}}

```
model2[v_] = Fit[datapureDij, v^2, v]
1486.33 v²

model22[v_] = Normal[model2[v]]
-9.83132 × 10<sup>7</sup> + 210992. v Log[v]

Show[ListPlot[datapureDij, PlotRange → {{0, 1200}, {0, 2 * 10^9}}],
Plot[model2[v], {v, 0, 1200}]]
2.0 × 10<sup>9</sup>
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1593274144

1593274144

ScientificForm[N[1593274144, 10]]

 $\textbf{1.593274144} \times \textbf{10}^{9}$

dataIncreasingDijyy = {497743, 62021, 80192, 36738, 88882, 22912, 41873, 52144, 20937, 19752, 697631, 71106, 202257, 107845, 107449, 75847, 101524, 59650, 121671, 89 673, 1064 618, 361 061, 381 209, 379 629, 320 373, 350 001, 305 757, 340 520, 363 431, 223 985, 3 420 998, 2 611 178, 2 337 023, 2 271 448, 2 343 739, 475 226, 437 698, 367 777, 363 037, 725 678, 11 858 144, 4 931 610, 1 554 855, 598 477, 635 215, 611 908, 605 588, 525 791, 613 489, 493 003, 28 174 644, 3 411 123, 3 628 391, 3 180 028, 3 285 107, 2 993 571, 2991596, 2960783, 1879574, 2091312, 45212480, 25356469, 22437560, 15714074, 15 838 905, 18 851 833, 18 058 208, 21 618 654, 18 888 966, 13 236 419, 177 976 831, 195 929 566, 218 763 740, 131 057 804, 146 105 455, 194 959 755, 166 491 995, 157 792 942, 208 712 879, 161 544 584, 1660 296 078, 1627 755 514, 1601 417 383, 1646 149 105, 1489 694 144, 1597 428 325, 1589 599 533, 1617 210 069, 1668 312 907, 1634 688 763} {497,743, 62,021, 80,192, 36,738, 88,882, 22,912, 41,873, 52,144, 20,937, 19,752, 697,631, 71,106, 202 257, 107 845, 107 449, 75 847, 101 524, 59 650, 121 671, 89 673, 1064 618, 361 061, 381 209, 379 629, 320 373, 350 001, 305 757, 340 520, 363 431, 223 985, 3 420 998, 2 611 178, 2 337 023, 2271448, 2343739, 475226, 437698, 367777, 363037, 725678, 11858144, 4931610, 1554855, 598477, 635215, 611908, 605588, 525791, 613489, 493003, 28174644, 3411123, 3628391, 3180028, 3285107, 2993571, 2991596, 2960783, 1879574, 2091312, 45212480, 25 356 469, 22 437 560, 15 714 074, 15 838 905, 18 851 833, 18 058 208, 21 618 654, 18 888 966, 13 236 419, 177 976 831, 195 929 566, 218 763 740, 131 057 804, 146 105 455, 194 959 755, 166 491 995, 157 792 942, 208 712 879, 161 544 584, 1660 296 078, 1627 755 514, 1601 417 383,

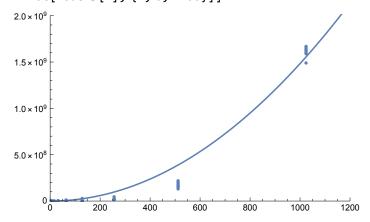
1646 149 105, 1489 694 144, 1597 428 325, 1589 599 533, 1617 210 069, 1668 312 907, 1634 688 763}

dataIncreasingDijxx = dataPureDijxx

dataincreasingDij = Transpose@{dataIncreasingDijxx, dataIncreasingDijyy}

 $\{\{4, 497743\}, \{4, 62021\}, \{4, 80192\}, \{4, 36738\}, \{4, 88882\}, \{4, 22912\}, \{4, 41873\},$ {4, 52 144}, {4, 20 937}, {4, 19 752}, {8, 697 631}, {8, 71 106}, {8, 202 257}, {8, 107 845}, $\{8, 107449\}, \{8, 75847\}, \{8, 101524\}, \{8, 59650\}, \{8, 121671\}, \{8, 89673\},$ $\{16, 1064618\}, \{16, 361061\}, \{16, 381209\}, \{16, 379629\}, \{16, 320373\}, \{16, 350001\},$ $\{16, 305757\}, \{16, 340520\}, \{16, 363431\}, \{16, 223985\}, \{32, 3420998\}, \{32, 2611178\},$ *{* 32*,* 2 337 023*}*, *{* 32*,* 2 271 448*}*, *{* 32*,* 2 343 739*}*, *{* 32*,* 475 226*}*, *{* 32*,* 437 698*}*, *{* 32*,* 367 777*}*, {32, 363 037}, {32, 725 678}, {64, 11 858 144}, {64, 4 931 610}, {64, 1 554 855}, {64, 598 477}, {64, 635 215}, {64, 611 908}, {64, 605 588}, {64, 525 791}, {64, 613 489}, {64, 493 003}, {128, 28 174 644}, {128, 3 411 123}, {128, 3 628 391}, {128, 3 180 028}, {128, 3 285 107}, $\{128, 2993571\}, \{128, 2991596\}, \{128, 2960783\}, \{128, 1879574\}, \{128, 2091312\},$ {256, 45 212 480}, {256, 25 356 469}, {256, 22 437 560}, {256, 15 714 074}, {256, 15 838 905}, {256, 18851833}, {256, 18058208}, {256, 21618654}, {256, 18888966}, {256, 13236419}, {512, 177 976 831}, {512, 195 929 566}, {512, 218 763 740}, {512, 131 057 804}, {512, 146 105 455}, {512, 194 959 755}, {512, 166 491 995}, {512, 157 792 942}, {512, 208712879}, {512, 161544584}, {1024, 1660296078}, {1024, 1627755514}, {1024, 1601417383}, {1024, 1646149105}, {1024, 1489694144}, {1024, 1597428325}, {1024, 1589599533}, {1024, 1617210069}, {1024, 1668312907}, {1024, 1634688763}}

Show[ListPlot[dataincreasingDij, PlotRange \rightarrow {{0, 1200}, {0, 2 * 10^9}}], Plot[model3[v], {v, 0, 1200}]]



dataincreasingBFSyy = {461795, 45824, 47009, 34763, 25282, 27652, 30022, 55305, 21727, 23307, 952823, 120880, 129177, 105869, 145768, 79007, 91253, 67156, 76636, 63600, 2083412, 397009, 340520, 407280, 412811, 346445, 331039, 243737, 383973, 306942, 5182456, 1885894, 1874438, 1459653, 361852, 523816, 604007, 343680, 738714, 767947, 18970343, 5178506, 1568287, 1432395, 1476639, 1469133, 1326131, 1030645, 843793, 1373140, 44222918, 10145669, 9436977, 11143921, 9488727, 12152049, 9602497, 9975409, 7972980, 9781052, 122824496, 109316689, 111063136, 93711644, 89865590, 93062603, 102606635, 104133443, 86136860, 90428513, 1127726083, 1084514848, 967769537, 1078211284, 992140396, 1022268485, 1021742299, 1041782001, 1063383272, 992676457, 13702352627, 12600627315, 15049289630, 14076505525, 15061360301, 14867503086, 14662453756, 13747698629, 13569159663, 14314119517}

{461795, 45824, 47009, 34763, 25282, 27652, 30022, 55305, 21727, 23307, 952823, 120880, 129177, 105869, 145768, 79007, 91253, 67156, 76636, 63600, 2083412, 397009, 340520, 407280, 412811, 346445, 331039, 243737, 383973, 306942, 5182456, 1885894, 1874438, 1459653, 361852, 523816, 604007, 343680, 738714, 767947, 18970343, 5178506, 1568287, 1432395, 1476639, 1469133, 1326131, 1030645, 843793, 1373140, 44222918, 10145669, 9436977, 11143921, 9488727, 12152049, 9602497, 9975409, 7972980, 9781052, 122824496, 109316689, 111063136, 93711644, 89865590, 93062603, 102606635, 104133443, 86136860, 90428513, 1127726083, 1084514848, 967769537, 1078211284, 992140396, 1022268485, 1021742299, 1041782001, 1063383272, 992676457, 13702352627, 12600627315, 15049289630, 14076505525, 15061360301, 14867503086, 14662453756, 13747698629, 13569159663, 14314119517}

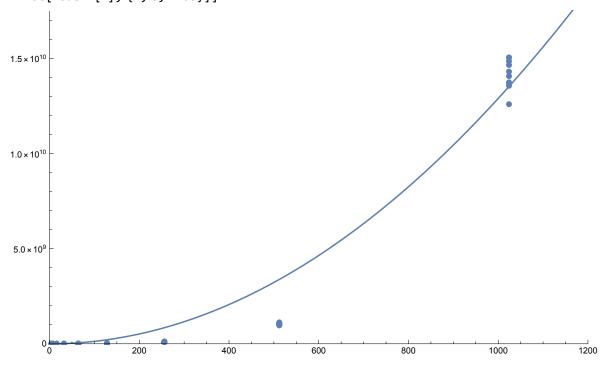
dataincreasingBFSxx = dataIncreasingDijxx

dataincreasingBFS = Transpose@{dataincreasingBFSxx, dataincreasingBFSyy}

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 \{8, 76636\}, \{8, 63600\}, \{16, 2083412\}, \{16, 397009\}, \{16, 340520\}, \{16, 407280\},
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 {512, 992 140 396}, {512, 1 022 268 485}, {512, 1 021 742 299}, {512, 1 041 782 001},
 {512, 1063 383 272}, {512, 992 676 457}, {1024, 13 702 352 627}, {1024, 12 600 627 315},
 \{1024, 15049289630\}, \{1024, 14076505525\}, \{1024, 15061360301\}, \{1024, 14867503086\},
 \{1024, 14662453756\}, \{1024, 13747698629\}, \{1024, 13569159663\}, \{1024, 14314119517\}\}
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model4[v_] = Fit[dataincreasingBFS, v^2, v] 12902.7 v²

Show[ListPlot[dataincreasingBFS, PlotRange \rightarrow {{0, 1200}, {0, 1.75 * 10^10}}], Plot[model4[v], {v, 0, 1200}]]



dataincreasingBruteyy = {32449707, 352766, 224774, 269413, 135892, 120485, 123250, 120881, 100734, 120881, 8364854, 2511234, 2687815, 3308413, 3420208, 3934148, 3348312, 2091708, 1408692, 1293343, 54402710727, 49508183335, 44729054584, 55571460344, 52 004 964 002, 43 769 434 607, 56 012 156 789, 54 863 641 230, 47 182 143 259, 45 151 013 757}

{32449707, 352766, 224774, 269413, 135892, 120485, 123250, 120881, 100734, 120881, 8 364 854, 2511 234, 2687 815, 3 308 413, 3 420 208, 3 934 148, 3 348 312, 2091 708, 1408 692, 1293 343, 54 402 710 727, 49 508 183 335, 44 729 054 584, 55 571 460 344, 52 004 964 002, 43 769 434 607, 56 012 156 789, 54 863 641 230, 47 182 143 259, 45 151 013 757

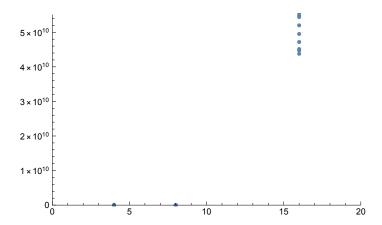
dataincreasingBrutexx =

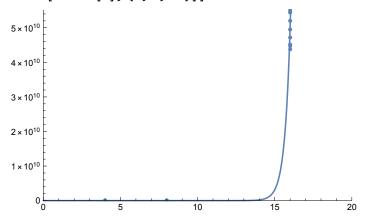
{4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 16, 16, 16, 16, 16, 16, 16, 16, 16}

dataincreasingBrute = Transpose@{dataincreasingBrutexx, dataincreasingBruteyy}

{4, 32449707}, {4, 352766}, {4, 224774}, {4, 269413}, {4, 135892}, {4, 120485}, {4, 123 250}, {4, 120 881}, {4, 100 734}, {4, 120 881}, {8, 8 364 854}, {8, 2 511 234}, $\{8, 2687815\}, \{8, 3308413\}, \{8, 3420208\}, \{8, 3934148\}, \{8, 3348312\},$ {8, 2091708}, {8, 1408692}, {8, 1293343}, {16, 54402710727}, {16, 49508183335}, $\{16, 44729054584\}, \{16, 55571460344\}, \{16, 52004964002\}, \{16, 43769434607\},$ {16, 56 012 156 789}, {16, 54 863 641 230}, {16, 47 182 143 259}, {16, 45 151 013 757}}

model5[v_] = Fit[dataincreasingBrute, v!, v] 0.00240501 v !





100 * Abs [61.2721865421079 - 61.272186279296875] / 61.2721865421079 4.28924×10^{-7}

datapureBruteyy = {21875426, 237811, 229515, 283239, 250846, 188431, 150113, 121671, 167494, 113375, 7571229, 2980930, 3437984, 2895998, 10819203, 1513377, 1272406, 1404347, 989956, 1284256, 80335864977, 60276242037, 64812170615, 79421342919, 76326746003, 62778158942, 73196402817, 72371204362, 60569862035, 59178342238}

{21875426, 237811, 229515, 283239, 250846, 188431, 150113, 121671, 167494, 113375, 7571229, 2980930, 3437984, 2895998, 10819203, 1513377, 1272406, 1404347, 989956, 1284256, 80335864977, 60276242037, 64812170615, 79421342919, 76326746003, 62778158942, 73196402817, 72371204362, 60569862035, 59178342238}

datapureBrutexx =

79 421 342 919. / 2895 998

27424.5

datapureBrute = Transpose@{datapureBrutexx, datapureBruteyy}

{4, 21875 426}, {4, 237811}, {4, 229515}, {4, 283239}, {4, 250846}, {4, 188431}, {4, 150113}, {4, 121671}, {4, 167494}, {4, 113375}, {8, 7571229}, {8, 2980930}, {8, 3437984}, {8, 2895998}, {8, 10819203}, {8, 1513377}, {8, 1272406}, {8, 1404347}, {8, 989956}, {8, 1284256}, {16, 80335864977}, {16, 60276242037}, {16, 64812170615}, {16, 79421342919}, {16, 76326746003}, {16, 62778158942}, {16, 73196402817}, {16, 72371204362}, {16, 60569862035}, {16, 59178342238}}

model6[v_] = Fit[datapureBrute, v!, v]

0.00329433 v!

Show[ListPlot[datapureBrute, PlotRange \rightarrow {{0, 20}, {0, 82371204362}}], Plot[model6[v], {v, 0, 32}]]

