**Тема: «Апроксимация экспериментальных данных методом наименьших квадратов».** Коломиец Л.В. Метод наименьших.pdf(стр.16-24)

**Задания:**

**1.** Методом наименьших квадратов по данной табличной зависимости найти аппроксимирующую функцию в виде:

**1.1** линейной функции;

**1.2** степенной функции;

**1.3** показательной функции;

**1.4** квадратичной функции.

Промежуточные вычисления вести с точностью до 0,0001. Значения параметров a,b,c , округлить до 0,01.

**2.** Построить в плоскости xO y графики полученных функций и нанести экспериментальные точки.

**3.** Сравнить полученные результаты.

**Варианты индивидуальных заданий:**

**Вариант1**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 2 | 3 | 4 | 5 | 6 | 7 |
| **y** | 100 | 190 | 270 | 400 | 500 | 600 |

**Вариант2**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 10 | 20 | 30 | 40 | 50 | 60 |
| **y** | 1,06 | 1,33 | 1,52 | 1,68 | 1,81 | 1,91 |

**Вариант3**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 3 | 5 | 7 | 9 | 11 | 13 |
| **y** | 26 | 76 | 150 | 240 | 360 | 500 |

**Вариант4**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 2 | 6 | 10 | 14 | 18 | 22 |
| **y** | 3,1 | 6,7 | 9,5 | 11,9 | 14,0 | 15,5 |

**Вариант5**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 1 | 3 | 5 | 7 | 9 | 11 |
| **y** | 2,0 | 10,1 | 22,6 | 37,1 | 54,5 | 73,2 |

**Вариант6**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 1 | 4 | 7 | 10 | 13 | 16 |
| **y** | 3,0 | 7,6 | 11,2 | 13,8 | 17,1 | 19,5 |

**Вариант7**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 3 | 5 | 7 | 9 | 11 | 13 |
| **y** | 3,5 | 4,4 | 5,7 | 6,1 | 6,5 | 7,3 |

**Вариант8**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 2 | 5 | 8 | 11 | 14 | 17 |
| **y** | 2,1 | 1,3 | 1,0 | 0,9 | 0,8 | 0,72 |

**Вариант9**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 1 | 5 | 9 | 13 | 17 | 21 |
| **y** | 2,0 | 3,4 | 4,2 | 4,6 | 5,2 | 5,4 |

**Вариант10**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 3 | 4 | 5 | 6 | 7 | 8 |
| **y** | 13 | 31 | 64 | 105 | 170 | 252 |

**Вариант11**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 2 | 4 | 6 | 8 | 10 | 12 |
| **y** | 2,4 | 2,9 | 3,0 | 3,5 | 3,6 | 3,7 |

**Вариант12**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 10 | 14 | 18 | 22 | 26 | 30 |
| **y** | 4,2 | 4,5 | 4,8 | 5,1 | 5,2 | 5,4 |

**Вариант13**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 1 | 16 | 13 | 46 | 61 | 76 |
| **y** | 0,5 | 4,0 | 6,9 | 8,8 | 10,9 | 12,1 |

**Вариант14**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 5 | 15 | 25 | 35 | 45 | 55 |
| **y** | 2,2 | 2,4 | 2,6 | 2,7 | 2,8 | 2,9 |

**Вариант15**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 1 | 2 | 3 | 4 | 5 | 6 |
| **y** | 2,0 | 0,68 | 0,44 | 0,24 | 0,12 | 0,14 |

**Вариант16**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 2 | 3 | 4 | 5 | 6 | 7 |
| **y** | 2 | 4,3 | 8,1 | 12,1 | 18,1 | 36,2 |

**Вариант17**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 2 | 5 | 8 | 11 | 14 | 17 |
| **y** | 4,8 | 8,8 | 12,1 | 15,0 | 17,4 | 19,7 |

**Вариант18**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 5 | 7 | 9 | 11 | 13 | 15 |
| **y** | 5,6 | 9,2 | 13,6 | 18,3 | 23,5 | 29,1 |

**Вариант19**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 25 | 40 | 55 | 70 | 85 | 100 |
| **y** | 2,4 | 3,2 | 3,8 | 4,3 | 4,7 | 5,1 |

**Вариант20**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **x** | 2 | 3 | 4 | 5 | 6 | 7 |
| **y** | 2,8 | 2,4 | 2,0 | 1,5 | 1,3 | 1,2 |