**Расчетно-графическая работа №1**

**«Первичная обработка экспериментальных данных»**

 ***Задание.***

1. ***Составить статистический интервальный ряд частот и относительных частот.***
2. ***Построить гистограмму относительных частот.***

***Варианты заданий.***

**Вариант 1**

14; 11; 13; 12; 10; 17; 15; 9; 7; 6; 9; 15; 14; 15; 17; 19; 9; 6; 16; 14; 7; 17; 14; 15; 11; 12; 9; 17; 14; 16; 17; 8; 5; 17; 13; 18; 16; 14; 15; 17; 16; 18; 19; 15; 14; 16; 18; 16; 14; 15.14; 13; 18; 15; 12; 13; 14; 12; 13; 16; 15; 15; 12; 13; 15; 14; 16; 18; 13; 15; 14; 16; 14; 13; 15; 12; 18; 12; 14; 16; 12; 13; 15; 15; 15; 13; 14; 15; 18; 16; 12; 15; 13; 13; 13; 15; 15; 17; 17.

**Вариант 2**

11; 15; 20; 25; 29; 34; 19; 25; 16; 21; 29; 20; 28; 35; 21; 22; 23; 26; 28; 30; 18; 13; 17; 22; 29; 26; 33; 36; 39; 14; 16; 24; 27; 25; 31; 32; 23; 37; 23; 27; 34; 37; 36; 42; 32; 34; 39; 38; 44.16; 13; 11; 15; 18; 19; 21; 18; 17; 15; 13; 16; 18; 17; 19; 15; 13; 12; 14; 16; 17; 20; 17; 17; 20; 19; 18; 22; 24; 18; 15; 14; 10; 12; 16; 18; 18; 19; 21; 23; 20; 22; 24; 17; 16; 14; 15; 23; 17; 34; 27; 22; 31; 19; 11; 15; 23; 28; 30; 26; 36.

**Вариант 3**

0,90; 0,79; 0,84; 0,86; 0,88; 0,90; 0,92; 0,89; 0,85; 0,91; 0,98; 0,91; 0,80; 0,87; 0,89; 0,88; 0,78; 0,84; 0,81; 0,85; 0,88; 0,94; 0,86; 0,80; 0,86; 0,91; 0,91; 0,78; 0,86; 0,91; 0,95; 0,97; 0,88; 0,79; 0,82; 0,84; 0,90; 0,81; 0,87; 0,91; 0,90; 0,82; 0,85; 0,90; 0,96; 0,98; 0,89; 0,87; 0,99; 0,85.0,90; 0,88; 0,19; 0,89; 0,93; 0,96; 0,98; 0,96; 0,90; 0,92; 0,93; 0,91; 0,86; 0,92; 0,91; 0,94; 0,90; 0,88; 0,90; 0,93; 0,95; 0,99; 0,91; 0,34; 1,00; 0,83; 0,93; 0,95; 0,96; 0,91; 0,89; 0,97; 0,90; 0,93.

**Вариант 4**

30; 19; 21; 23; 26; 27; 29; 31; 24; 25; 28; 28; 27; 23; 26; 32; 34; 26; 24; 22; 19; 23; 27; 30; 29; 25; 18; 18; 5; 20; 22; 24; 28; 31; 33; 25; 18; 21; 26; 30; 32; 34; 29; 28; 21; 20; 23; 25; 27; 30; 32.17; 27; 12; 28; 32; 39; 50; 57; 68; 78; 82; 13; 23; 47; 80; 28; 37; 22; 18; 12; 33; 48; 58; 71; 12; 26; 85; 30; 42; 44; 19; 13; 31; 34; 55; 72; 14; 25; 46; 52; 65; 14; 15; 24; 85; 45; 54; 62; 56; 53; 31; 45; 29; 70; 68; 29; 48; 27; 38.

**Вариант 5**

160; 210; 260; 285; 310; 330; 85; 190; 230; 290; 305; 325; 351; 405; 247; 265; 308; 345; 360; 410; 130; 165; 170; 240; 272; 292; 348; 370; 200; 225; 280; 340; 390; 180; 190; 232; 250; 253; 263; 380; 420; 340; 325; 310; 400; 240; 220; 290; 350; 333; 405; 295; 450; 285; 225; 300; 355; 310; 385; 348; 245; 350; 335; 392; 381.261; 260; 258; 263; 257; 260; 264; 259; 261; 260; 264; 261; 265; 261; 660; 263; 260; 260; 259; 260; 258; 265; 259; 265; 261; 258; 259; 259; 259; 259.

**Вариант 6**

50; 52; 140; 138; 165; 162; 210; 165; 170; 142; 150; 170; 168; 163; 63; 68; 88; 85; 105; 110; 112; 131; 125; 126; 135; 148; 92; 99; 102; 110; 115; 118; 125; 121; 118; 130; 133; 141; 182; 199; 205; 127; 132; 135; 98; 105; 119; 115; 125; 124.85; 76; 80; 84; 88; 89; 91; 88; 84; 85; 75; 82; 86; 89; 88; 84; 90; 89; 85; 91; 87; 81; 78; 85; 88; 91; 89; 87; 74; 81; 87; 90; 88; 86; 76; 84; 88; 77; 82; 85; 84; 74; 80; 84; 91; 93.

**Вариант 7**

19,2; 18,1; 18,4; 18,2; 18,6; 18,9; 19,0; 19,7; 18,9; 19,2; 18,4; 18,5; 19,3; 18,3; 18,7; 18,8; 19,1; 19,4; 19,7; 19,1; 18,9; 19,3; 18,4; 19,2; 18,2; 18,7; 19,5; 19,3; 18,5; 18,6; 18,8; 19,1; 18,7; 19,1; 19,6; 18,6; 18,8; 19,1; 19,0; 19,5; 19,3; 18,8; 19,0; 19,5; 18,9; 19,0; 19,8; 19,8; 19,9;19,5; 19,5; 19,6; 19,8; 20,0; 20,2; 20,4; 19,6; 19,9; 19,9; 20,0; 20,3; 20,2; 19,6; 20,1; 20,3; 20,5; 20,4; 19,8; 19,7; 19,8; 20,0; 20,1; 19,7; 20,3; 20,2; 20,1; 20,3; 20,2; 20,1; 24,4; 20,5; 20,3; 20,5; 20,2; 20,5.

**Вариант 8**

48; 29; 6; 18; 24; 30; 35; 25; 17; 23; 27; 33; 28; 19; 14; 8; 24; 36; 42; 47; 40; 28; 12; 7; 25; 27; 15; 6; 16; 25; 34; 40; 27; 20; 6; 13; 28; 37; 43; 27; 38; 53; 24; 41; 21; 11; 17; 25; 46; 51.18; 20; 31; 45; 52; 60; 35; 15; 21; 33; 47; 55; 62; 36; 40; 49; 56; 61; 54; 30; 15; 22; 32; 44; 63; 41; 52; 17; 21; 30; 54; 65; 51; 42; 26; 32; 45; 50; 64; 25; 39; 42; 42; 53; 69; 58; 45; 29; 34; 46; 59; 37; 20; 43; 55; 5; 52; 38; 48; 51; 45.

**Вариант 9**

95; 57; 15; 26; 35; 46; 52; 55; 59; 47; 36; 31; 13; 17; 32; 42; 48; 58; 56; 102; 96; 45; 54; 56; 60; 64; 55; 53; 37; 30; 10; 16; 20; 49; 48; 43; 12; 19; 51; 103; 97; 28; 11; 27; 51; 62; 61; 38; 29; 10; 39; 40; 18; 14; 41; 50; 57; 61; 71; 73; 58; 63; 59; 60; 63; 68; 70; 71; 75; 82; 76; 85; 90; 83; 86; 87; 92; 99; 66; 68; 78; 91; 94; 77; 65; 72; 69; 76; 84; 98; 79; 67; 74; 80; 89; 69; 81; 88; 100; 90.40; 62; 82; 100; 110; 119.

**Вариант 10**

3; 4; 8; 12; 14; 19; 18; 23; 2; 3; 5; 9; 12; 10; 13; 6; 10; 10; 7; 11; 15; 6; 12; 10; 14; 16; 5; 11; 11; 10; 13; 10; 8; 11; 7; 9; 12; 9; 14; 13; 16; 18; 11; 10; 12; 9; 9; 15; 13; 11; 12.3; 5; 6; 5; 6; 4; 5; 6; 4; 5; 5; 6; 1; 2; 4; 5; 6; 4; 5; 4; 6; 5; 6; 5; 6; 2; 4; 5; 4; 5; 5; 3; 6; 1; 3; 4; 5; 4; 5; 4; 7; 6; 5; 6; 4; 5; 2; 5; 4; 5; 5; 6; 3; 5; 2; 4; 5; 4; 5; 4; 7; 6; 6; 3; 6; 5; 7; 5; 4; 5; 5; 7; 9; 10; 9; 7; 8; 4; 7; 4; 10; 9; 5; 8; 4; 8; 7; 8; 4; 5; 5; 9; 10;

**Вариант 11**

4,7; 7,2; 6,2; 6,7; 7,2; 5,7; 5,2; 7,7; 8,2; 6,2; 7,2; 5,7; 6,2; 5,7; 8,2; 5,7; 6,7; 6,2; 5,7; 6,2; 6,7; 5,2; 7,7; 6,2; 7,2; 6,7; 7,7; 6,2; 7,2; 8,2; 6,2; 5,7; 6,2; 6,7; 7,2; 5,7; 6,7; 7,7; 8,2; 4,7; 8,7; 4,2; 4,7; 8,7; 6,2; 6,7;3; 7; 8; 3; 7; 7; 6; 7; 6; 7; 5; 8; 2; 10; 5; 8; 7; 6; 7; 6; 7; 6; 7; 8; 5; 11; 5; 7; 8; 7; 4; 5; 2; 3; 8; 5; 7; 6; 7; 10; 7; 8; 7; 8; 4; 7; 5; 7; 6; 11; 10; 5; 6; 3; 5; 7; 8; 7; 8; 6; 7; 4; 9; 10; 8; 4; 8; 9; 6; 7; 10; 7; 7; 7; 9; 7.

**Вариант 12**

1,03; 1,06; 1,09; 1,12; 1,01; 1,06; 1,05; 1,10; 1,09; 1,13; 1,20; 1,04; 1,08; 1,10; 1,15; 1,11; 1,02; 1,04; 1,04; 1,07; 1,11; 1,14; 1,05; 1,07; 1,10; 1,13; 1,14; 1,08; 1,06; 1,08; 1,09; 1,13; 1,12; 1,16; 1,09; 1,17; 1,10; 1,15; 1,11; 1,13; 1,10; 1,14; 1,19; 1,21; 1,11; 1,18; 1,23; 1,10; 1,19; 1,03;1,47; 1,54; 1,56; 1,57; 1,59; 1,60; 1,87; 1,64; 1,83; 1,76; 1,72; 1,74; 1,61; 1,77; 1,68; 1,73; 1,71; 1,74; 1,61; 1,84.

**Вариант 13**

5,12; 4,44; 4,54; 4,32; 4,45; 4,56; 4,69; 4,60; 4,53; 4,46; 4,37; 4,28; 4,47; 4,48; 4,38; 4,30; 4,49; 4,55; 4,68; 4,91; 5,10; 4,55; 4,57; 4,70; 4,81; 5,02; 5,04; 4,82; 4,75; 4,59; 4,53; 4,60; 4,74; 4,49; 4,61; 4,79; 4,90; 5,05; 5,07; 5,12; 5,08; 4,31; 4,52; 4,46; 4,63; 4,51; 4,34; 4,26; 4,50; 4,62; 4,73; 4,77; 4,49; 4,36; 4,29; 4,42; 4,50; 4,78; 4,52; 4,93; 4,82; 5,12; 4,27; 4,33; 4,54; 4,64; 4,71; 4,69; 4,80;4,21; 5,19; 4,38; 4,96; 5,07; 4,56; 4,25; 5,00; 4,85; 5,15; 4,79; 4,38; 5,12; 5,15; 4,62; 4,53; 4,28; 5,00; 4,86; 4,99; 5,03; 5,14; 4,66; 4,46; 5,13; 4,78; 4,99; 5,02; 5,12.

**Вариант 14**

-5; 0; 3; -3; -1; 1; -5; 4; -4; -2; -2; 2; 4; 0; -4; -5; -2; -3; -2; 4; -3; 1; 2; 3; -5; -4; 3; -2; -1; -3; -5; -3; 3; 0; 2; 1; -1; -4; -2; 2; 0; -2; 2; -4; -3; 3; -3; 2; -3; -2; -4; -3; -1; 1; -3; -2; -3; -4; -3; -2; -2; -1; -3; -2; -1; -2; -3; -2; -3; -1; -2; -1; -2; -3; -2; -1; -2; -3; -1; -2; -2; -1; -3; -2; -1; -2; -1; -2; -3; -2; -2; -3; -2; -1; -2; 1; 0; 2; 1; 2;-4; 0; -1; 0; -2; 0; -1; 0; 1; -3; -1; 0; -2; 0; -1; 0; 1; -2; 0; 1; -2; -1; 0; -1; 4; 1; -2; 4; 1; -3; -1; 0; -4; 0; -2; -1; -4; 0; -2; 0; -2; -3; 0; 3; -2; 0; -1; 1; 3; -3; 0; -2; -1; 0; -4; -2; 1; -2; 2.

**Вариант 15**

-2; 1; -1; 0; 1; 3; 4; 7; 4; 7; 3; 2; 3; 2; 3; 2; 3; 2; 3; 2; 3; 2; 1; 0; 1; 0; 4; 7; 4; 6; 1; 0; 1; -2; 1; 2; 4; 2; 7; 6; 1; -1; 1; 0; 1; 0; 1; -1; 1; 5; 0; 1; 2; 6; 1; -1; 4; 1; 0; 6; 6; 1; -1; 1; -2; 0; 1; 5; 6; 5; 0; 2; 1; 0; 5; 1; -1; 5; 1; 2; 1; 6; 5; 2; 1; 0; 1; 2; 1; -1; 1; 0; 1; 2; 1; 0; 1; -1; 1; 2;-2; 3; 1; 0; 1; 3; 1; 1; 3; 0; 2; -1; 2; 1; 2; -1; 2; 0; 2; 1; 0; 1; 3; -3; 1; 1; 2; 1; 3; 0; 1; -2; 0; 1; 1; 3; 0; 1; 2; 1; 2; 1; 1; 2; -1; 2; -1; -3; 3; -2; 0; 3; -1; 2; 3; 1; 0; 3; 2;1; 2; 1; -2; 4; 1; 4; 1; 4; 6; 0; 1; 4; 0; 2; 0; -3; -1; 0; 4; 1; 0; -1; 5; 1; 0; 2.

**Вариант 16**

1; 3; 2; 3; 2; 3; 3; 2; 3; 2; 3; 2; 1; 3; 3; 2; 6; 7; 3; 6; 3; 4; 2; 0; 1; 2; 3; 2; 3; 6; 3; 2; 4; 3; 4; 0; 1; 3; 8; 3; 3; 7; 3; 2; 4; 3; 4; 3; 5; 2; 3; 2; 3; 7; 3; 1; 2; 4; 5; 6; 1; 3; 2; 2; 4; 2; 3; 7; 3; 2; 2; 6; 3; 4; 3; 0; 3; 2; 4; 3; 3; 2; 8; 2; 3; 4; 3; 1; 2; 5; 2; 3; 5; 4; 3; 1; 4; 2; 5; 2;3; 4; 3; 4; 3; 4; 3; 4; 3; 4; 2; 4; 2; 7; 5; 2; 5; 7; 4; 3; 4; 5; 7; 5; 6; 4; 6; 5; 6; 4; 3; 2; 3; 0; 4; 5; 2; 4; 4; 3; 4; 5; 4; 5; 2; 4; 5; 6; 5; 4; 5; 3; 5; 1; 7; 1; 7; 2; 6; 3; 3; 2; 3; 8; 3; 8; 4; 5; 3; 4; 4; 3; 4; 2; 4; 1; 4; 2; 9; 3; 3; 4; 3; 4; 3; 4; 8; 4; 9; 4.

**Вариант 17**

5; 8; 7; 9; 8; 8; 9; 5; 9; 12; 8; 9; 5; 8; 9; 12; 8; 5; 9; 5; 9; 12; 7; 8; 4;9; 5;8; 5; 8; 9; 4; 9; 7; 8; 4; 8; 13; 9; 13; 9; 7; 9; 2; 7; 3; 8; 8; 8; 12; 8; 5; 3; 13; 9; 10; 3; 8; 7; 9; 8; 10; 7; 8; 5; 8; 7; 13; 7;8; 5; 8; 9; 7; 8; 9; 8; 13; 8; 10; 8; 9; 7; 9; 7; 8; 7; 10; 7; 8; 12; 7; 10; 7; 10; 7; 8; 8; 5; 9; 8;5; 4; 5; 4; 5; 4; 5; 4; 5; 4; 4; 6; 4; 6; 4; 6; 4; 6; 4; 6; 5; 4; 6; 4; 5; 4; 6; 4; 5; 4; 4; 6; 4; 3; 4; 5; 4; 3; 5; 4; 5; 4; 5; 4; 5; 4; 5; 4; 2; 6; 5; 2; 5; 3; 5; 6; 5; 3; 6; 7; 6; 6; 5; 7; 6; 4; 5; 2; 6; 2; 5; 2; 6; 7; 6; 2; 6; 5; 6; 5; 10.

**Вариант 18**

2; -1; -4; 5; 2; 0; 2; 0; 6; 2; 5; 7; 2; -1; 0; 4; -3; 2; 6; 4; 2; 5; 7; -4; 2; -1; 4; 2; 4; 2; 5; -3; 2; 5; 0; 2; 0; 6; 6; 0; 2; -1; 5; 7; 7; -4; 6; 2; 4; 2; 5; 5; 2; -3; 0; 4; 0; 4; 6; 0; 2; 7; -1; 0; 4; -3; 4; 6; 4; 2; 5; 2; 5; 2; 7; 4; 6; 4; 6; 0; 2; 7; 4; 7; 4; 8; -3; 8; 4; 2; 8; 2; 8; 2; 8; 5; 8; 2; 8; 3; 4; 2; 4; 2; 3; 2; 3; 2; 3; 6; -2; 3; 4; 3; 4; 3; 4; 3; 0; 3; 6; 2; 3; 2; 4; 2; 3; 2; 4; 3; 4; 3; -2; 4; 4; 3; 4; 3; 0; -1; 2; 4; 3; 6; -1; 6; 3; 2; 4; 6; 4; -1; 4; 3; 4; 3; 4; 3; 0; 4; 6; 2; 6; -1; 3; 4; 3; 2; 7; 6; 4; 6; 2; 4; 2; 6; 2; 3; 0; 7; 8.

**Вариант 19**

3; 4; 3; 8; 3; 8; 3; 4; 8; 4; 4; 3; -4; 2; 3; 2; 4; 3; 2; 3; 2; 8; 4; 8; 0; 4; 0; 2; 3; 2; 3; 3; 2; -4; 6; -2; 6; 3; 6; 3; 4; 6; 0; 6; 2; 11; 0; 2; 0; 2; 3; 0; 6; 3; 10; -4; 4; 0; 3; 2; 10; 6; 3; -2; 0; 3; 8; -2; 2; 3; 3; -2; 11; 2; 2; 3; -2; 2; 4; 3; 0; 2; 3; 10; -2; 6; 2; -2; 8; -2; 3; 10; 2; 3; 2; 3; 10; 3; 2; 3; 2;5; 6; 5; 6; 5; 7; 5; 9; 7; 1; 6; 10; 6; -1; 7; 5; 3; 6; 5; 6; 3; 6; 5; 7; 5; 6; 8; 3; 7; 5; 7; 5; 6; 8; 3; 7; 5; 7; 5; 7; -1; 6; 3; 6; 6; 6; 1; 7; 6; -3; 7; 6; 1; 7; 3; 1; 7; 5; 7; 6; -1; 7; 8; 3; 6; 7; 6; -3; 6; 5; 6; 3; 7; 6; 6; 1; 7; 5; 3; 7.

**Вариант 20**

-1; 3; 0; 3; 5; 3; 5; 2; 5; 2; 2; 5; 3; 5; 0; 5; 2; 5; 3; 5; 5; 5; 12; -2; 12; 5; 0; 5; 5; 2; 2; -1; 5; -1; 5; 2; 5; 3; 0; 10; 0; 5; 0; 5; -2; 6; 0; 6; 2; 6; 5; 3; 3; 2; 5; -1; 5; 3; 6; 2; 0; 5; -1; 5; 3; -2; 6; 2; -1; 6; 8; 3; 5; 3; 5; 5; 3; 5; 3; 6; 0; 8; 3; 6; 3; 6; -1; 5; 6; 2; 8; 3; 8; 3; 8; 6; 10; 6; 10; 6; 5; -2; 3; 5; 9; 0; -2; 0; -1; 0; 0; 9; 9; 0; 2; -1; 9; -1; 0; -1; 9; 5; 6; -1; 2; -2; 2; -2; -1; 0; 0; 0; -1; 5; 0; -3; 0; -1; 9; -1; 7; -1; -5; 0; 3; 2; 0; -2; 0; -2; 1; 9; -1; 5; -5; 7; -3; 1; -3; -1; 7; 1; -2; 5; 0; -2; 2; -1; 1; -2; 0; 3; -1; 1

**Вопросы при защите РГР №1**

1. Как определяется число интервалов для выборки?
2. Как определяется длина интервала?
3. Что такое частота?
4. Что такое относительная частота?
5. Что называют гистограммой частот?
6. Что подразумевают под полигоном частот?
7. Как определить размах по заданной выборке?
8. Что такое накопленная частота?
9. Что такое интервальный ряд?