```
num1 = N[1 / 7]; num2 = N[num1 / 7]; num3 = N[num2 / 7]; num4 = N[num3 / 7];
num5 = N[num4 / 7]; num6 = N[num5 / 7]; num7 = N[num6 / 7]; num8 = N[num7 / 7];
num9 = N[num8 / 7]; num10 = N[num9 / 7]; num11 = N[num10 / 7];
num12 = N[num11 / 7]; num13 = N[num12 / 7]; num14 = N[num13 / 7];
num15 = N[num14 / 7]; num16 = N[num15 / 7]; num17 = N[num16 / 7];
num18 = N[num17 / 7]; num19 = N[num18 / 7]; num20 = N[num19 / 7]
```

$1.25325 \times 10^{-17}$

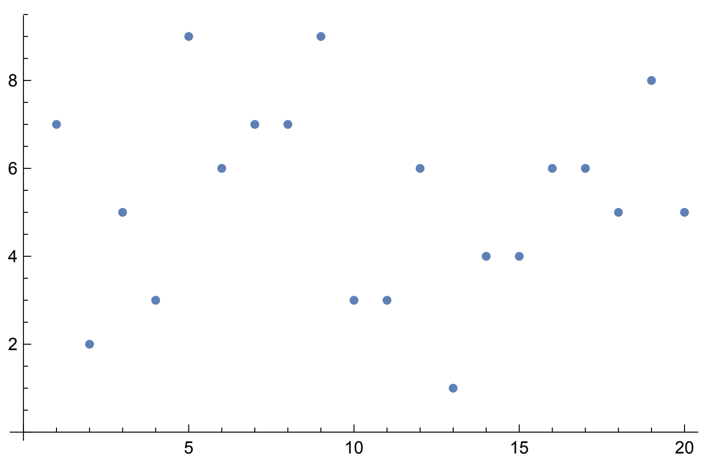
```
{ScientificForm[num1, 6], ScientificForm[num2, 6],
 ScientificForm[num3, 6], ScientificForm[num4, 6], ScientificForm[num5, 6],
 ScientificForm[num6, 6], ScientificForm[num7, 6], ScientificForm[num8, 6],
 ScientificForm[num9, 6], ScientificForm[num10, 6], ScientificForm[num11, 6],
 ScientificForm[num12, 6], ScientificForm[num13, 6], ScientificForm[num14, 6],
 ScientificForm[num15, 6], ScientificForm[num16, 6], ScientificForm[num17, 6],
 ScientificForm[num18, 6], ScientificForm[num19, 6], ScientificForm[num20, 6]}
```

$\{1.42857 \times 10^{-1}, 2.04082 \times 10^{-2}, 2.91545 \times 10^{-3}, 4.16493 \times 10^{-4}, 5.9499 \times 10^{-5},$
$8.49986 \times 10^{-6}, 1.21427 \times 10^{-6}, 1.73467 \times 10^{-7}, 2.47809 \times 10^{-8}, 3.54013 \times 10^{-9},$
$5.05733 \times 10^{-10}, 7.22476 \times 10^{-11}, 1.03211 \times 10^{-11}, 1.47444 \times 10^{-12}, 2.10634 \times 10^{-13},$
$3.00906 \times 10^{-14}, 4.29866 \times 10^{-15}, 6.14095 \times 10^{-16}, 8.77278 \times 10^{-17}, 1.25325 \times 10^{-17}\}$

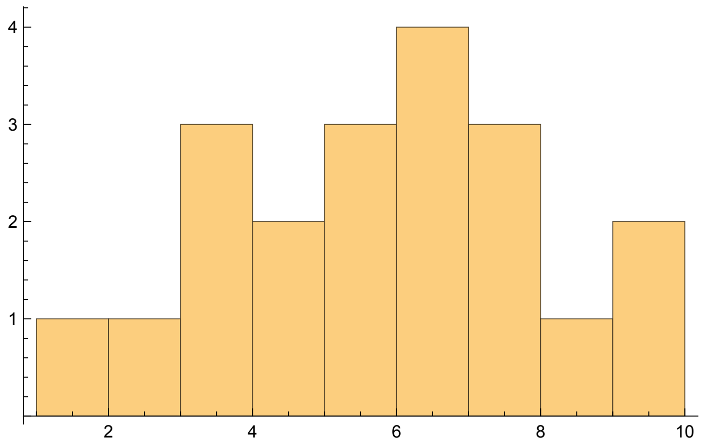
```
randomNums = {7, 2, 5, 3, 0, 6, 7, 7, 9, 3, 3, 6, 1, 4, 4, 6, 6, 5, 8, 5}
```

{7, 2, 5, 3, 0, 6, 7, 7, 9, 3, 3, 6, 1, 4, 4, 6, 6, 5, 8, 5}

```
ListPlot[randomNums]
```



```
Histogram[randomNums, {1, 10, 1}]
```




```
{test1 = RandomReal[{0, 1}],
 test2 = RandomReal[{0, 1}], test3 = RandomReal[{0, 1}],
 test4 = RandomReal[{0, 1}], test5 = RandomReal[{0, 1}]}
```

```
{0.841163, 0.465924, 0.587357, 0.632313, 0.855435}
```

```
SeedRandom[1]
RandomReal[{0, 1}]
```

```
0.817389
```

```
SeedRandom[1]
RandomReal[{0, 1}]
```

```
0.817389
```

```
SeedRandom[1]
RandomReal[{0, 1}]
```

```
0.817389
```

The uncertainty for a count measurement will be the square root of the number of counts. Then, the percentage uncertainty will be the count uncertainty/number of counts.

```
countUncertainty = Sqrt[100];
percentUncertainty = N[countUncertainty / 100]
```

```
0.1
```

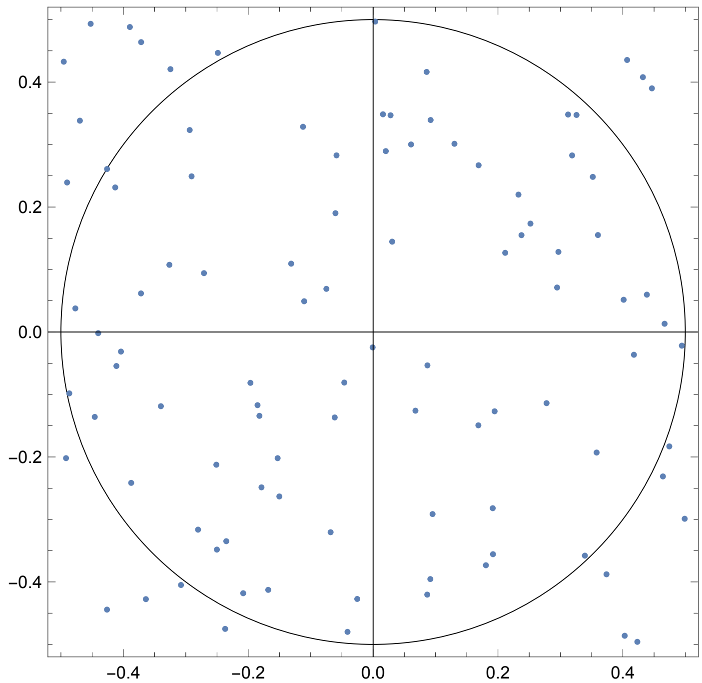
First, we have to generate a list of 100 points using Random Reals:

```
numPoints = 100;
points = RandomReal[{-0.5, 0.5}, {numPoints, 2}];
```

Next, we have to find the Norm of each of these points.

```
pointsNorm = Map[Norm, points];
```

```
Show[Graphics[Circle[{0, 0}, 0.5], Axes → True, Frame → True],
 ListPlot[points, AspectRatio → 1]]
```




Now, we can count the amount of points whose norm is below 0.5:

```
numInRange = Count[pointsNorm, _?(# ≤ 0.5 &)]
```

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Thus, we get the fraction of points that are in the circle and multiply it by the area of the circle:

```
approximatePi = N[4 * (numInRange) / numPoints]
```

3.12