Generate random numbers using linear congruence method for the following
(i) 10 random numbers using a=1,b=7,c=8
(ii) 15 random numbers using a=1,b=7,c=10
(iii) 10 random numbers using a=5,b=1,c=8
(iv) 20 random numbers using a=5,b=3,c=16
(v) 10 random numbers using a=1,b=7,c=10

In[7]:=
```
a = 1;
b = 7;
c = 10;
x[0] = 7;
Nmax = 10;
For[n = 1, n ≤ Nmax, n++,
 x[n] = Mod[x[n - 1] * a + b, c];
 Print[x[n]]
]
```

```
4
1
8
5
2
9
6
3
0
7
```

Find random number b/w 0 to π and 0 to 1

In[21]:=
```
a = 17;
b = 32 871;
c = 10 000;
x[0] = 7;
Nmax = 10;
For[n = 1, n ≤ Nmax, n++,
 x[n] = Mod[x[n - 1] * a + b, c];
 Print[N[Pi * x[n] / 10 000]]
]

y[0] = 8;
Nmax = 10;
For[n = 1, n ≤ Nmax, n++,
 y[n] = Mod[y[n - 1] * a + b, c];
 Print[N[y[n] / 10 000]]
]
```

```
0.939336

1.1627

1.81835

0.39804

1.38544

2.46332

1.93773

2.42751

1.32889

1.502

0.3007

0.399

0.0701

0.4788

0.4267

0.541

0.4841

0.5168

0.0727

0.523
```

Using random number generation, find the approximate area under curve y=Sin(t) b/w 0 to Pi

In[51]:=
```
a = 17;
b = 32 871;
c = 10 000;
x[0] = 7;
Nmax = 2000;
For[n = 1, n ≤ Nmax, n++,
 x[n] = Mod[x[n - 1] * a + b, c];
 xnorm[n] = x[n] / 10 000 * Pi
]
y[0] = 8;
For[n = 1, n ≤ Nmax, n++,
 y[n] = Mod[y[n - 1] * a + b, c];
 ynorm[n] = y[n] / 10 000
]
f[t_] = Sin[t];
undercurve = {};
For[n = 1, n ≤ Nmax, n++,
 If[ynorm[n] < f[xnorm[n]],
  AppendTo[undercurve, xnorm[n]]]]
Length[undercurve]
N[Pi * Length[undercurve] / Nmax]
```

Out[62]= 1278

Out[63]= 2.00748

In[64]:=
```
N[Integrate[Sin[t], {t, 0, Pi}]]
```

Out[64]= 2.