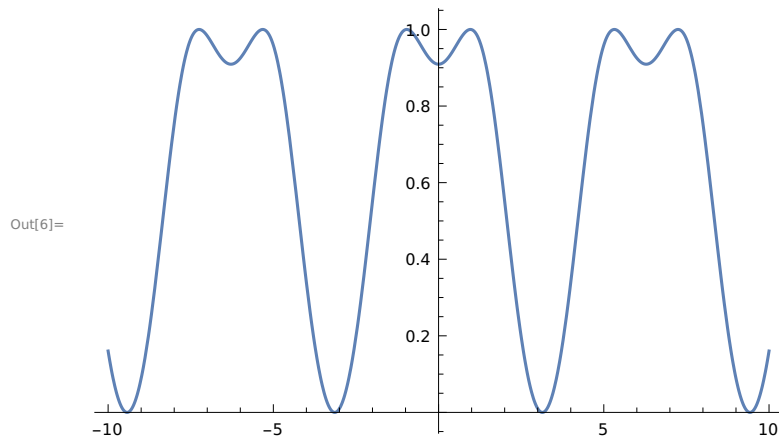


ASSIGNMENT CHAPTER 3

EX - 3.2

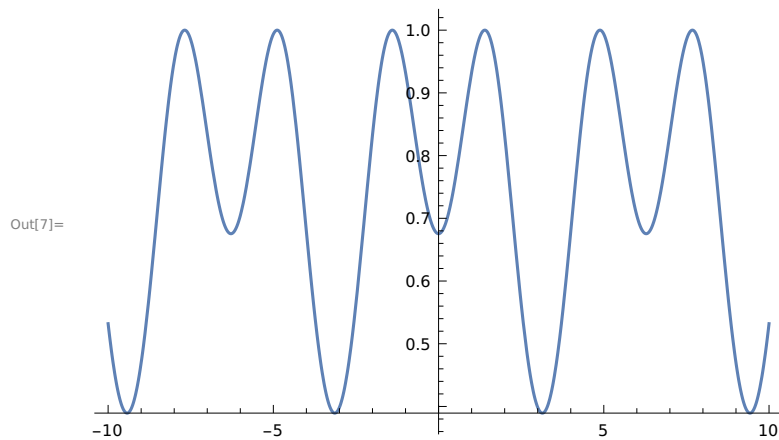
Q1).a).

In[6]:= `Plot[Sin[1 + Cos[x]], {x, -10, 10}]`



b).

In[7]:= `Plot[Sin[1.4 + Cos[x]], {x, -10, 10}]`

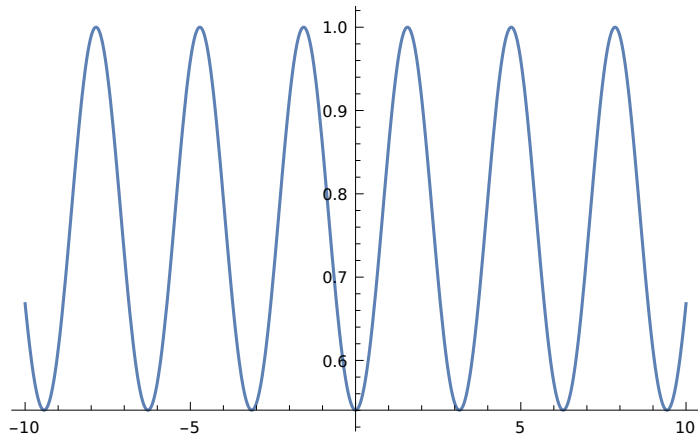


c)

In[9]:=

```
Plot[Sin[(Pi / 2) + Cos[x]], {x, -10, 10}]
```

Out[9]=

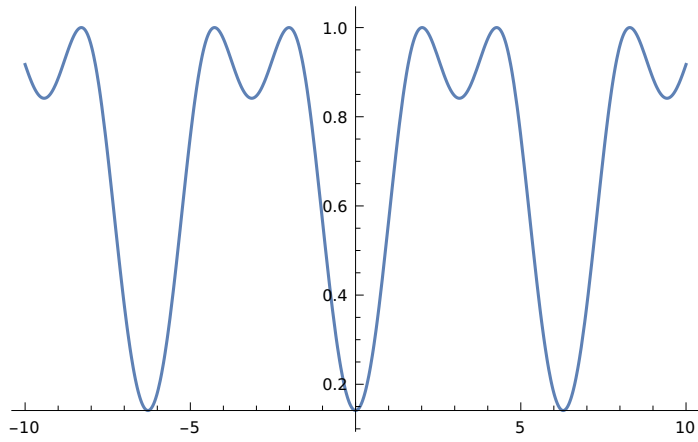


d)

In[10]:=

```
Plot[Sin[2 + Cos[x]], {x, -10, 10}]
```

Out[10]=

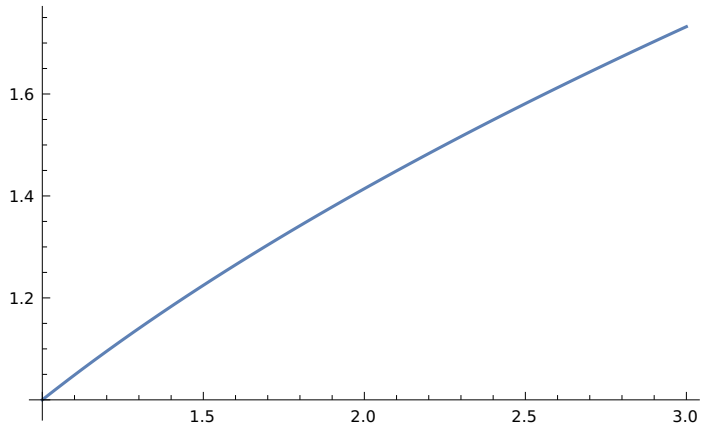


Q2) a)

In[16]:=

```
With[{ $\delta = 10^0$ }, Plot[Sqrt[x], {x, 2 -  $\delta$ , 2 +  $\delta$ }]
```

Out[16]=

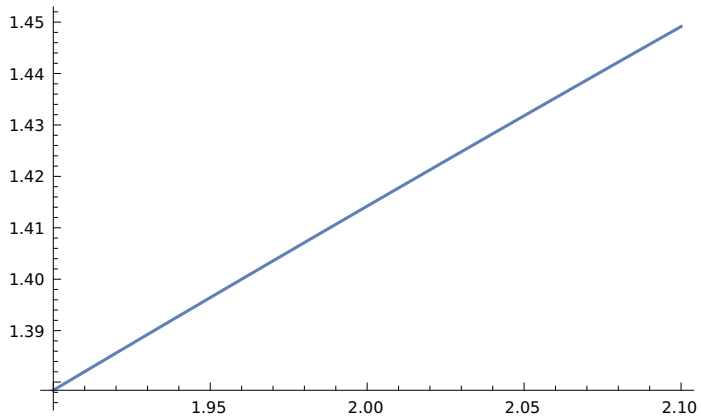


b)

In[17]:=

```
With[{ $\delta = 10^{-1}$ }, Plot[Sqrt[x], {x, 2 -  $\delta$ , 2 +  $\delta$ }]
```

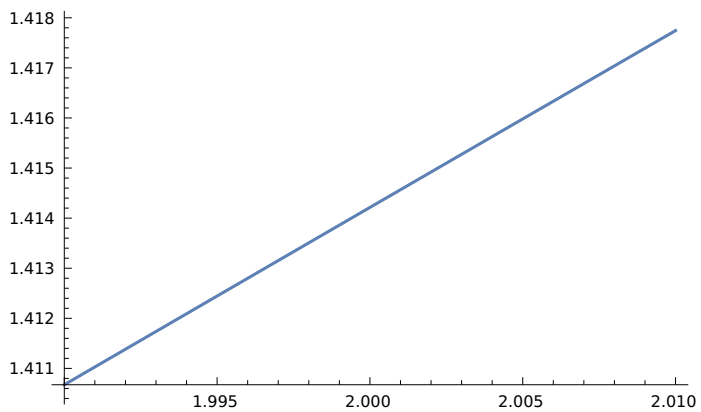
Out[17]=



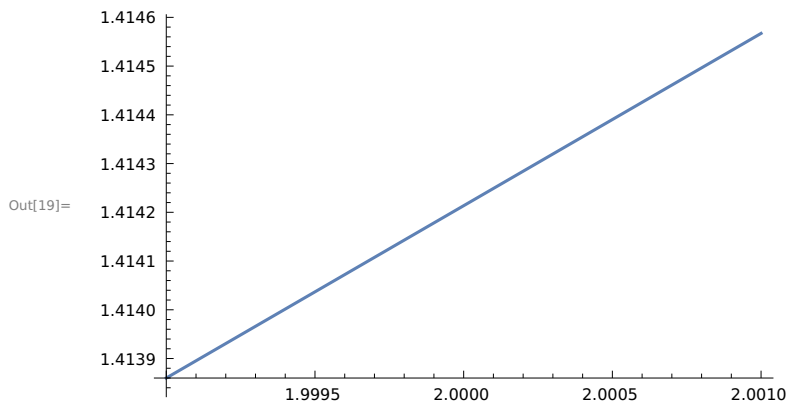
In[18]:=

```
With[{ $\delta = 10^{-2}$ }, Plot[Sqrt[x], {x, 2 -  $\delta$ , 2 +  $\delta$ }]
```

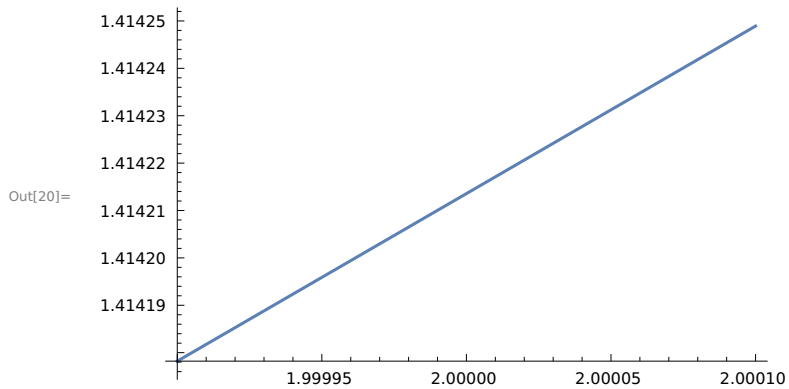
Out[18]=



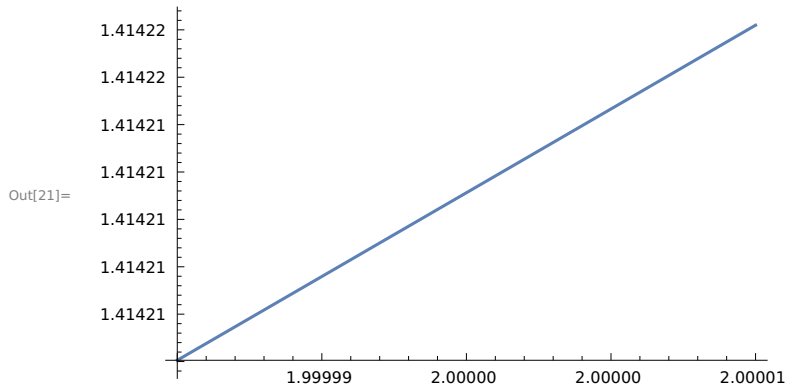
In[19]:= **With**[[$\delta = 10^{-3}$], **Plot**[**Sqrt**[x], {x, 2 - δ , 2 + δ }]



In[20]:= **With**[[$\delta = 10^{-4}$], **Plot**[**Sqrt**[x], {x, 2 - δ , 2 + δ }]



In[21]:= **With**[[$\delta = 10^{-5}$], **Plot**[**Sqrt**[x], {x, 2 - δ , 2 + δ }]



c). WE APPROXIMATE $\sqrt{2} = 1.414$

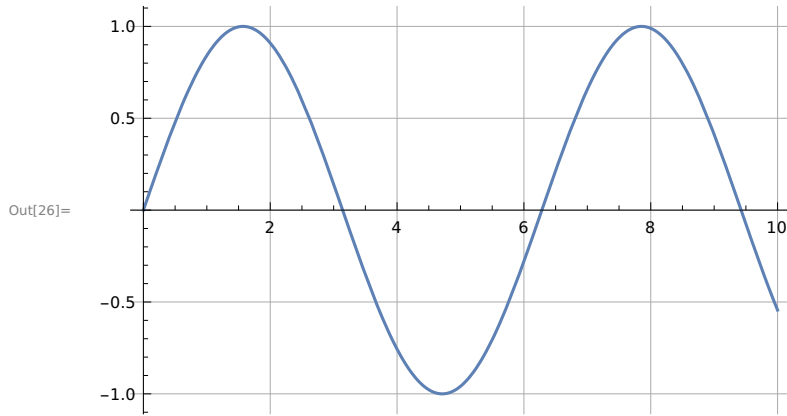
In[1]:= **N**[**Sqrt**[2], 6]

Out[1]= 1.41421

EX - 3.3

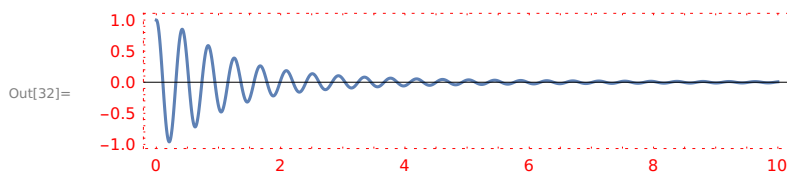
Q1)

```
In[26]:= Plot[Sin[x], {x, 0, 10}, Ticks → Automatic,
  GridLines → Automatic, GridLinesStyle → Lighter[Gray]]
```



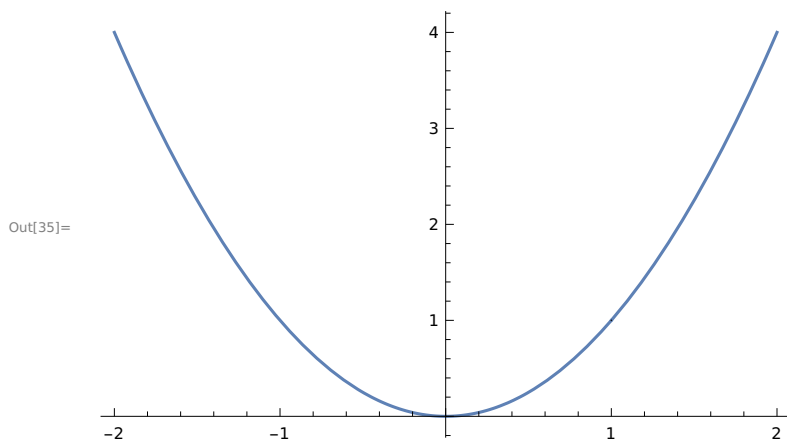
Q2)

```
In[32]:= Plot[y = Cos[15 x]/(1 + x ^ 2), {x, 0, 10}, Axes → True, Frame → True, Filling → Axes,
  FrameStyle → Directive[Red, Dotted], PlotRange → All, AspectRatio → Automatic]
```



Q4)

```
In[35]:= Plot[x ^ 2, {x, -2, 2}, Exclusions → {x == 1}, ExclusionsStyle → Dashed]
```



Since no vertical asymptotes at $x = 1$. Hence no exclusions can be seen in the graph.

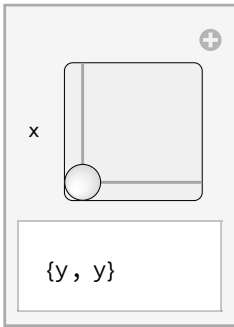
EX - 3.4

Q1)

In[33]:=

```
Manipulate[{x, y}, {x, y, {0, 1}}
```

Out[33]=

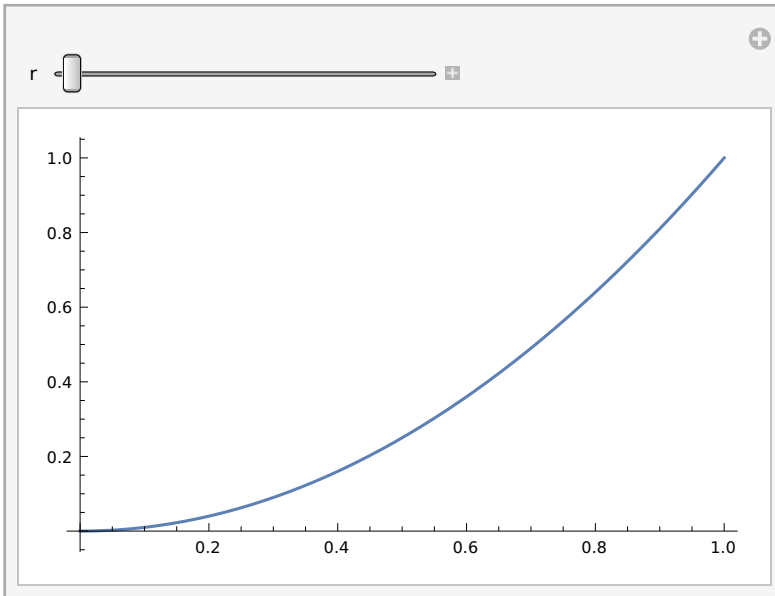


Q2)

In[3]:=

```
Manipulate[Plot[x^2, {x, 0, r}], {r, 1, 3}, ImageSize -> {Automatic, 128}, AspectRatio -> 5 / 6]
```

Out[3]=



EX - 3.5

Q1).a)

In[34]:= **Range[100]**

Out[34]= {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22,
23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41,
42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61,
62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81,
82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100}

In[5]:= **Partition[Range[100], 10]**

Out[5]= {{1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, {11, 12, 13, 14, 15, 16, 17, 18, 19, 20},
{21, 22, 23, 24, 25, 26, 27, 28, 29, 30}, {31, 32, 33, 34, 35, 36, 37, 38, 39, 40},
{41, 42, 43, 44, 45, 46, 47, 48, 49, 50}, {51, 52, 53, 54, 55, 56, 57, 58, 59, 60},
{61, 62, 63, 64, 65, 66, 67, 68, 69, 70}, {71, 72, 73, 74, 75, 76, 77, 78, 79, 80},
{81, 82, 83, 84, 85, 86, 87, 88, 89, 90}, {91, 92, 93, 94, 95, 96, 97, 98, 99, 100}}

b)

In[6]:=

Table[x, {x, 1, 100}]

Out[6]= {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22,
23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41,
42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61,
62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81,
82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100}

In[7]:= **Partition[Table[x, {x, 1, 100}], 20]**

Out[7]= {{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20},
{21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40},
{41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60},
{61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80},
{81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100}}

c)

In[8]:=

Table[Range[10], 10]

```
Out[8]= {{1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, {1, 2, 3, 4, 5, 6, 7, 8, 9, 10},
        {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, {1, 2, 3, 4, 5, 6, 7, 8, 9, 10},
        {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, {1, 2, 3, 4, 5, 6, 7, 8, 9, 10},
        {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}}
```

In[9]:=

Table[x, {x, 1, 100}]

```
Out[9]= {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22,
        23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41,
        42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61,
        62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81,
        82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100}
```

Q4).a).

In[10]:=

f[x_] := x ^ 3In[11]:= **Sum[f[x], {x, 1, 20}]**

Out[11]= 44 100

b).

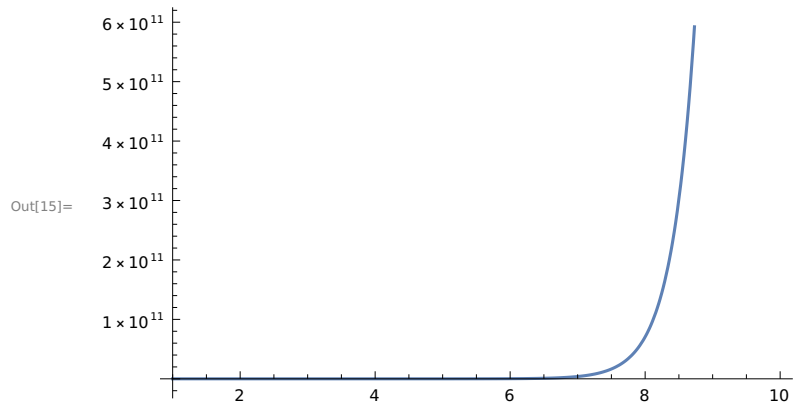
```
In[13]:= f[x_] := 1 + 2 ^ x + 3 ^ x + 4 ^ x + 5 ^ x + 6 ^ x + 7 ^ x + 8 ^ x + 9 ^ x + 10 ^ x +
        11 ^ x + 12 ^ x + 13 ^ x + 14 ^ x + 15 ^ x + 16 ^ x + 17 ^ x + 18 ^ x + 19 ^ x + 20 ^ x
```

In[14]:= **Table[f[x], {x, 1, 10}]**

```
Out[14]= {210, 2870, 44 100, 722 666, 12 333 300, 216 455 810,
        3 877 286 700, 70 540 730 666, 1 299 155 279 940, 24 163 571 680 850 }
```

c)

In[15]:= `Plot[f[x], {x, 1, 10}]`



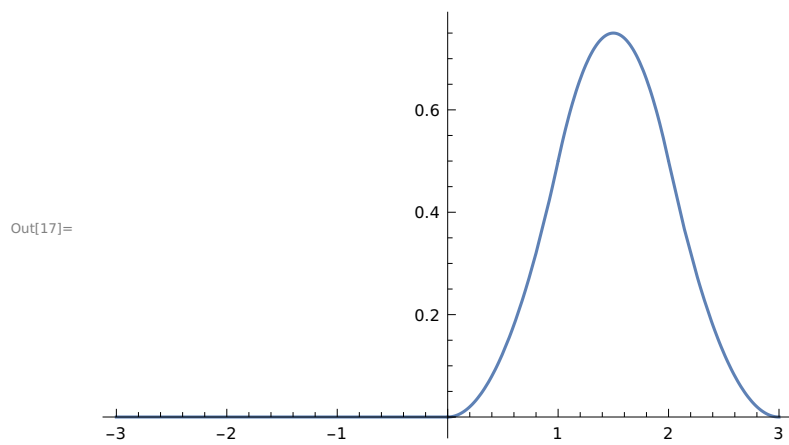
EX - 3.6

Q2).

In[16]:=

```
f[x_] := Piecewise[{{0, x < 0}, {x^2/2, 0 ≤ x < 1},
  {-x^2 + 3x - 3/2, 1 ≤ x < 2}, {(1/2)(3-x)^2, 2 ≤ x < 3}, {0, x ≤ 3}}]
```

In[17]:= `Plot[f[x], {x, -3, 3}]`



Q3).

In[31]:=

```
f[x_] := Piecewise[{{n^2, n ≤ x < n + 1}, {1, n ≤ x ≤ n + 1}}]  
Plot[f[x], {x, 0, 20}]
```

Out[32]=

