

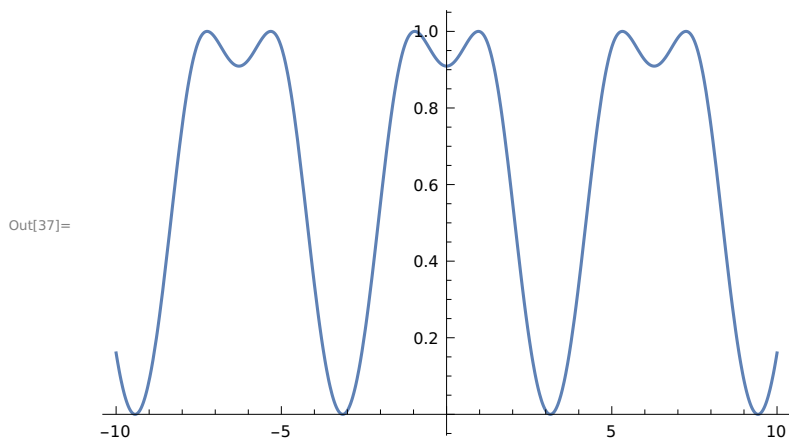
ASSIGNMENT → CHAPTER-3

SEC-3.2

Q .1

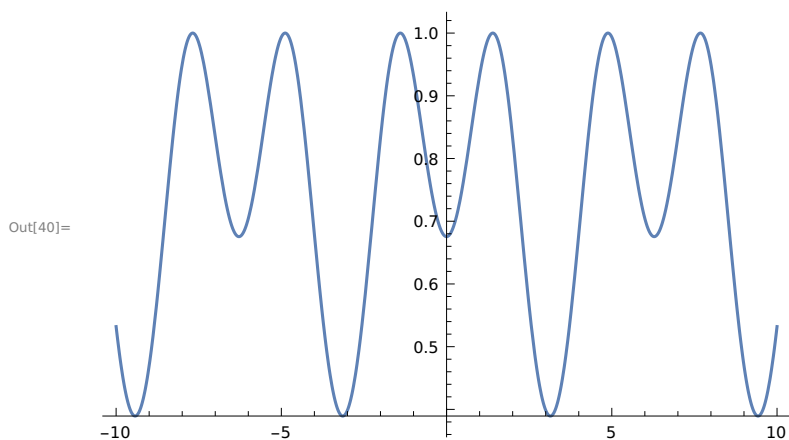
```
In[36]:= f[x_] := Sin[1 + Cos[x]];
```

```
In[37]:= Plot[f[x], {x, -10, 10}]
```



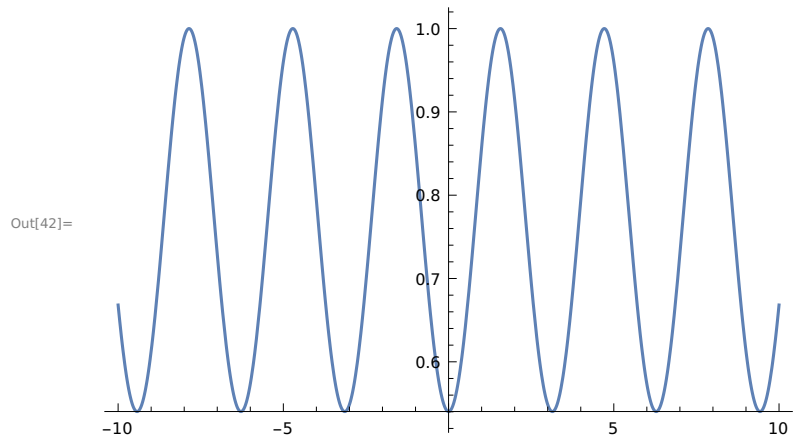
```
In[38]:= g[x_] := Sin[1.4 + Cos[x]];
```

```
In[40]:= Plot[g[x], {x, -10, 10}]
```



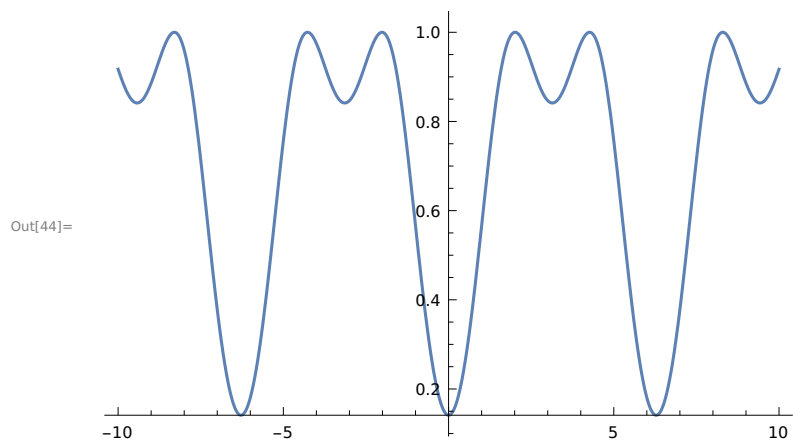
```
In[41]:= h[x_] := Sin[ $\pi/2 + \text{Cos}[x]$ ];
```

```
In[42]:= Plot[h[x], {x, -10, 10}]
```



```
In[43]:= z[x_] := Sin[2 + Cos[x]];
```

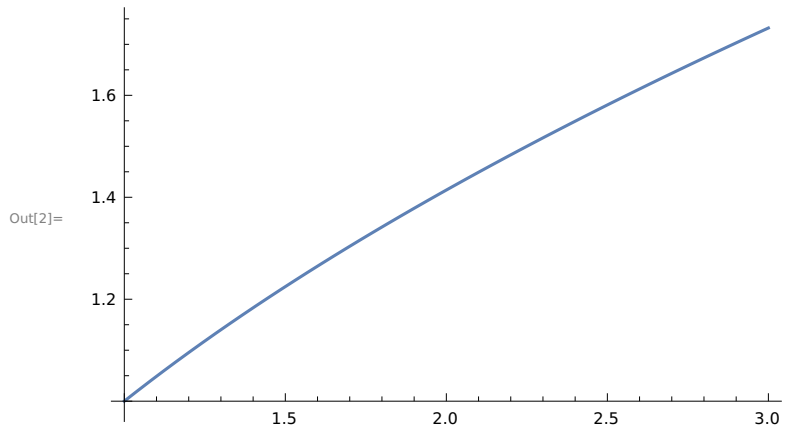
```
In[44]:= Plot[z[x], {x, -10, 10}]
```



Q .2

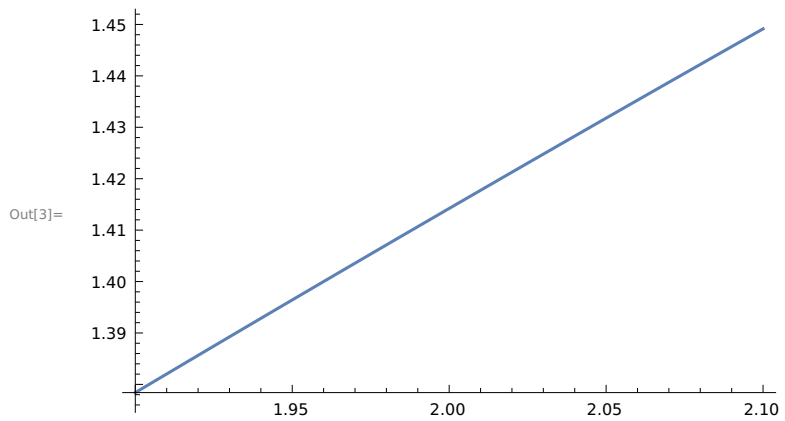
a.

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

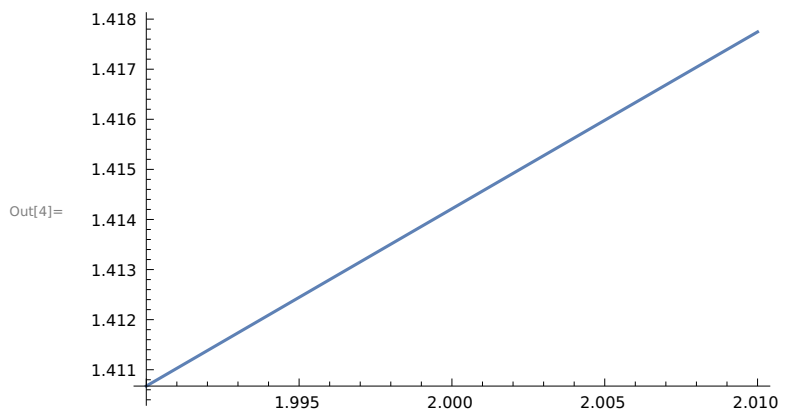


b.

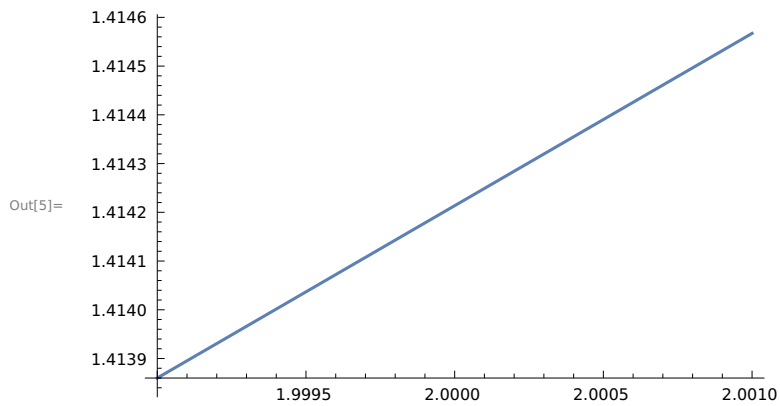
In[3]:= `With[{ $\delta = 10^{(-1)}$ }, Plot[Sqrt[x], {x, 2 - δ , 2 + δ }]`



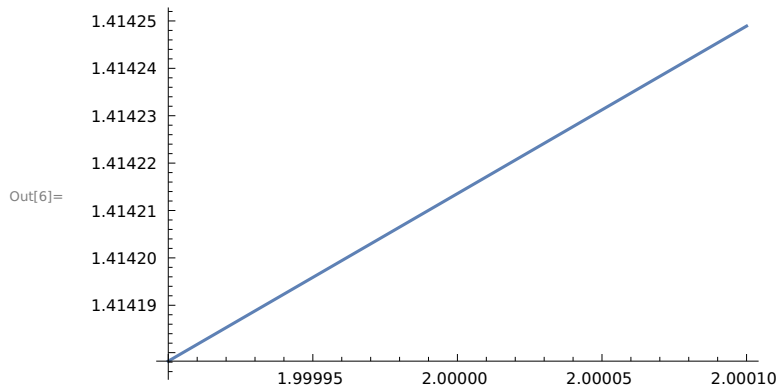
In[4]:= `With[{ $\delta = 10^{(-2)}$ }, Plot[Sqrt[x], {x, 2 - δ , 2 + δ }]`



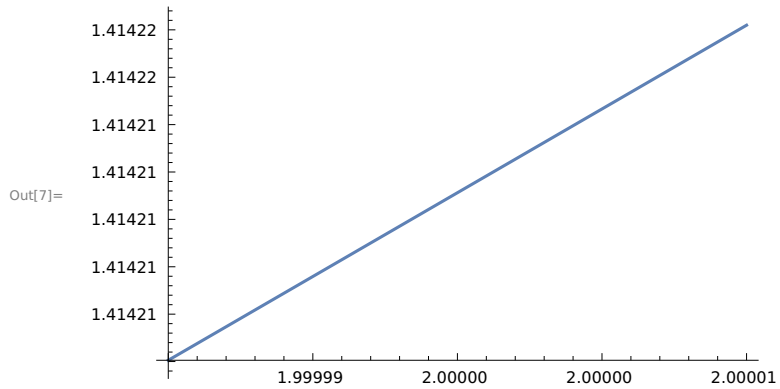
In[5]:= `With[{ $\delta = 10^{-3}$ }, Plot[Sqrt[x], {x, 2 - δ , 2 + δ }]`



In[6]:= `With[{ $\delta = 10^{-4}$ }, Plot[Sqrt[x], {x, 2 - δ , 2 + δ }]`



In[7]:= `With[{ $\delta = 10^{-5}$ }, Plot[Sqrt[x], {x, 2 - δ , 2 + δ }]`



c.

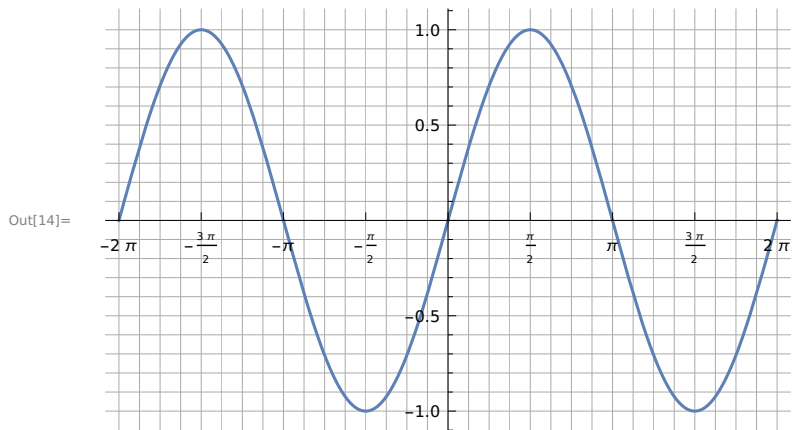
In[8]:= `N[Sqrt[2], 6]`

Out[8]= 1.41421

SEC-3.3

Q .1

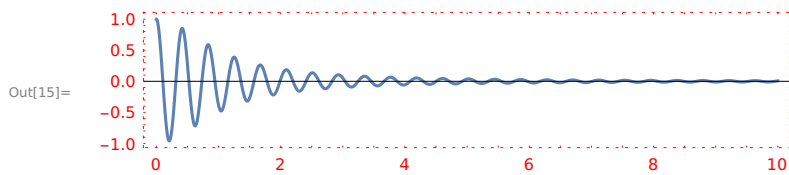
```
In[14]:= Plot[Sin[x], {x, -2 π, 2 π}, GridLinesStyle → Lighter[Gray],
  GridLines → {Range[-2 π, 2 π, π/8], Range[-1, 1, 0.1]},
  Ticks → {Range[-2 π, 2 π, π/2], Automatic}]
```



Q .2

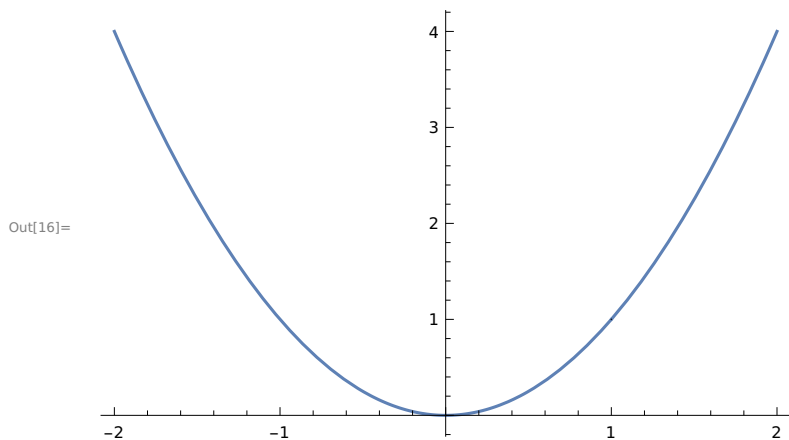
```
In[14]:= b[x_] := Cos[(15 * x)] / (1 + x ^ 2);
```

```
In[15]:= Plot[b[x], {x, 0, 10}, Axes → True, Frame → True, Filling → Axes,
  FrameStyle → Directive[Red, Dotted], PlotRange → All, AspectRatio → Automatic]
```



Q .4

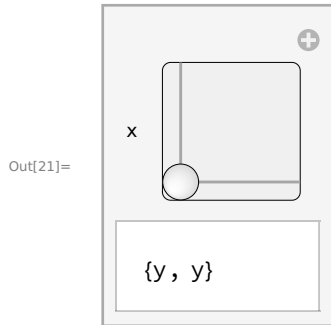
```
In[16]:= Plot[x^2, {x, -2, 2}, Exclusions → {x == 1}, ExclusionsStyle → Dashed]
```



SEC-3.4

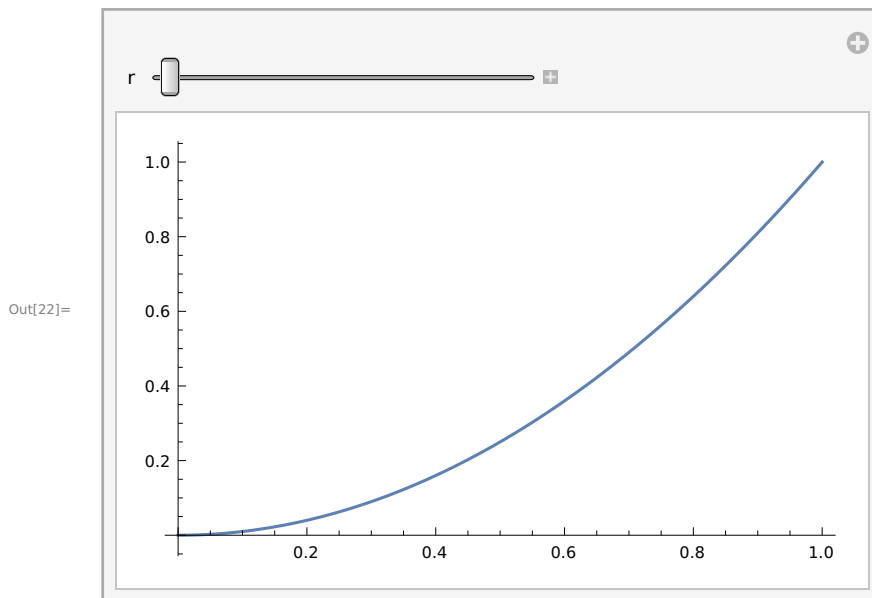
Q .1

In[21]:= `Manipulate[{x, y}, {x, y, {0, 1}}`



Q .2

In[22]:= `Manipulate[Plot[x^2, {x, 0, r}], {r, 1, 3}, ImageSize -> {Automatic, 128}, AspectRatio -> 5 / 6]`



SEC-3.5

Q .1

a.

In[23]:= **Range[100]**

Out[23]= {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[24]:= **Partition[Range[100], 10]**

Out[24]= {{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[25]:= **Table[x, {x, 1, 100}]**

Out[25]= {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[26]:= **Partition[Table[x, {x, 1, 100}], 20]**

Out[26]= {{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[27]:= **Table[Range[10], 10]**

Out[27]= {{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[28]:= **Table[x, {x, 1, 100}]**

Out[28]= {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}

Q .4

a.

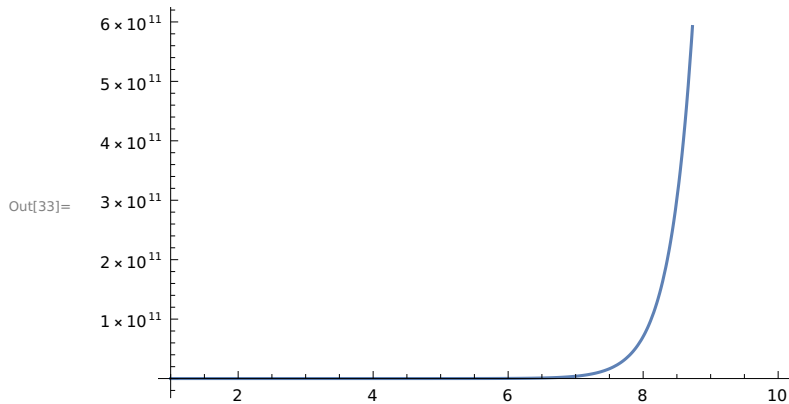
In[29]:= $f[x_] := x^3;$ In[30]:= $\text{Sum}[f[x], \{x, 1, 20\}]$

Out[30]= 44 100

b.

In[31]:= $f[x_] := 1 + 2^x + 3^x + 4^x + 5^x + 6^x + 7^x + 8^x + 9^x + 10^x +$
 $11^x + 12^x + 13^x + 14^x + 15^x + 16^x + 17^x + 18^x + 19^x + 20^x$ In[32]:= $\text{Table}[f[x], \{x, 1, 10\}]$ Out[32]= {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[33]:= $\text{Plot}[f[x], \{x, 1, 10\}]$ 

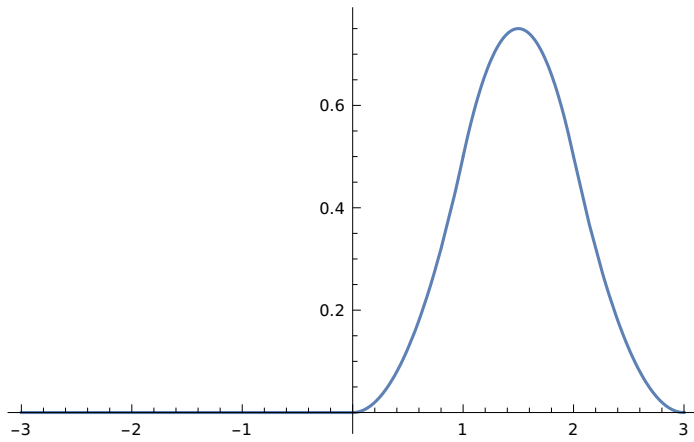
SEC-3.6

Q .2

In[34]:= $f[x_] := \text{Piecewise}[\{\{0, x < 0\}, \{(x^2)/2, 0 \leq x < 1\},$
 $\{-x^2 + 3 * x - 3/2, 1 \leq x < 2\}, \{(1/2) (3 - x)^2, 2 \leq x < 3\}, \{0, x \leq 3\}\}]$

In[35]:= **Plot[f[x], {x, -3, 3}]**

Out[35]=



Q.3

In[3]:= **f[x_] := Piecewise[{{n^2, n < x < n + 1}, {1, n <= x <= n + 1}}**

In[4]:= **Plot[f[x], {x, 0, 20}]**

Out[4]=

