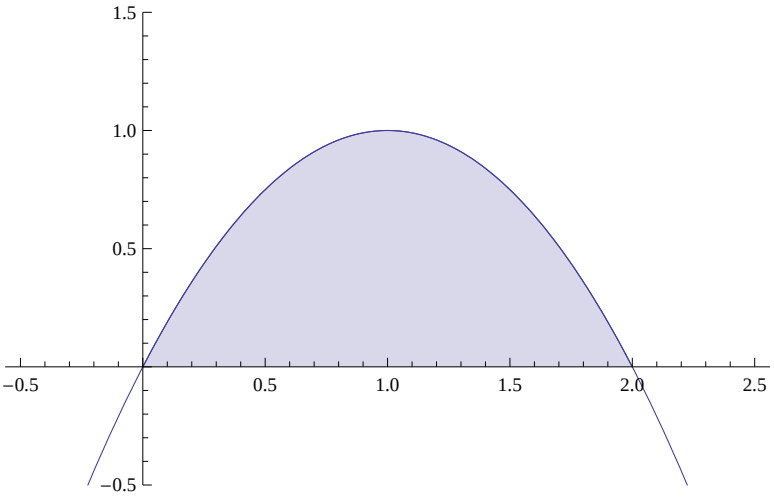
Áreas bajo la curva

In[1]:=
```
"a)"
f[x_] := 2 x - x^2
∫_0^2 f[x] dx
p1 := Plot[f[x], {x, -0.5, 2.5}, PlotRange → {-0.5, 1.5}]
p2 := Plot[f[x], {x, 0, 2}, Filling → Bottom]
Show[p1, p2]
```

Out[1]= a)

Out[3]= $\frac{4}{3}$

Out[6]=

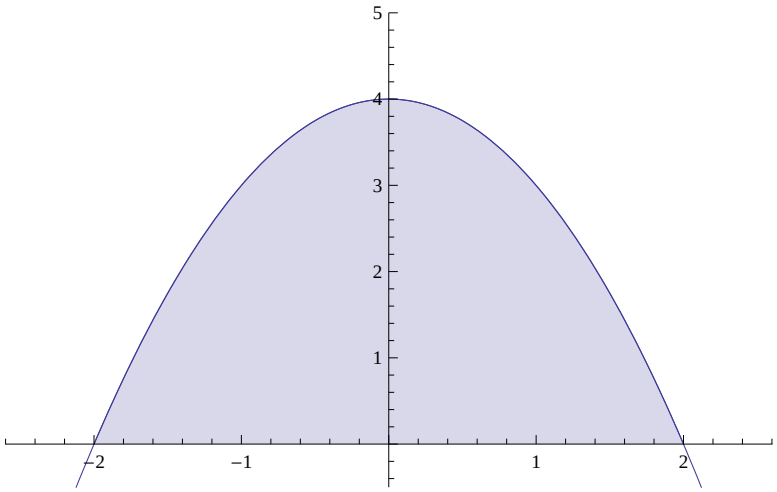


In[7]:=
```
"b)"
f[x_] := 4 - x^2
∫_-2^2 f[x] dx
p1 := Plot[f[x], {x, -2.5, 2.5}, PlotRange → {-0.5, 5}]
p2 := Plot[f[x], {x, -2, 2}, Filling → Bottom]
Show[p1, p2]
```

Out[7]= b)

Out[9]= $\frac{32}{3}$

Out[12]=

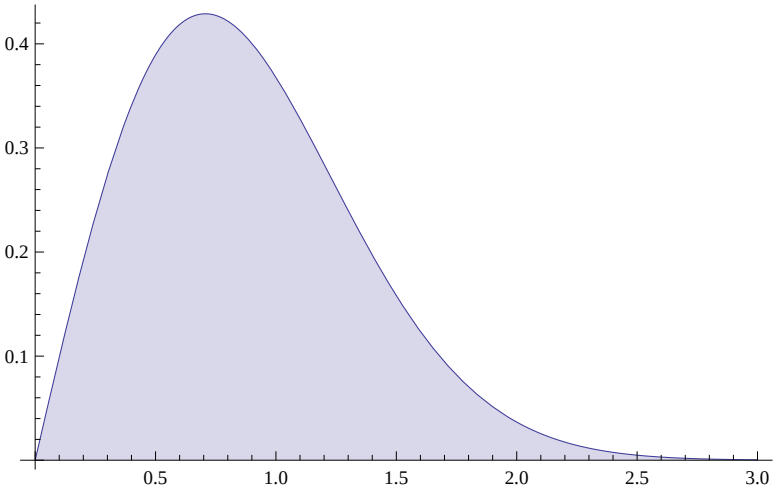


In[13]:=
```
"c)"
f[x_] := x e^-x^2
N[∫_0^3 f[x] dx]
Plot[f[x], {x, 0, 3}, Filling → Bottom]
```

Out[13]= c)

Out[15]= 0.499938

Out[16]=



Áreas entre curvas

In[17]:=
```
"a)"
f[x_] := 4 - x^2
g[x_] := x^2
Solve[f[x] == g[x], x]
```

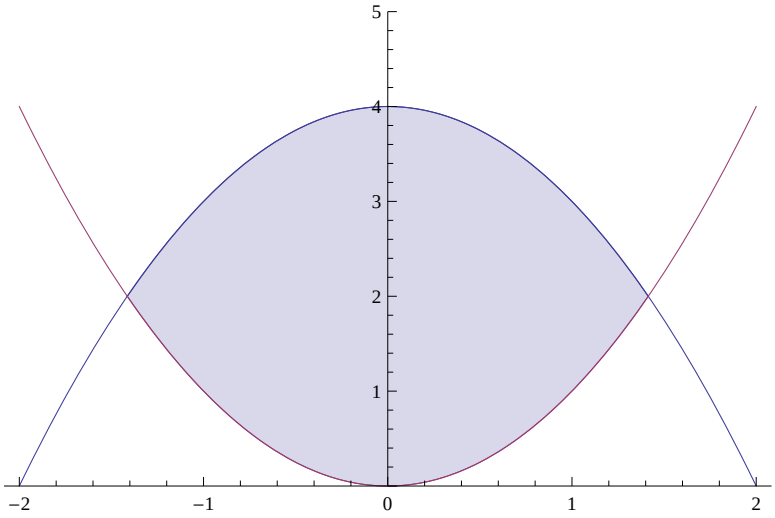
Out[17]= a)

Out[20]= $\{\{x \to -\sqrt{2}\}, \{x \to \sqrt{2}\}\}$

In[21]:=
```
N[∫_-√2^√2 (f[x] - g[x]) dx]
p1 := Plot[{f[x], g[x]}, {x, -2, 2}, PlotRange → {0, 5}]
p2 := Plot[{f[x], g[x]}, {x, -√2, √2}, Filling → {1 → {2}}]
Show[p1, p2]
```

Out[21]= 7.54247

Out[24]=



In[25]:=
```
"b)"
f[x_] := x + 2
g[x_] := x^2
Solve[f[x] == g[x], x]
```

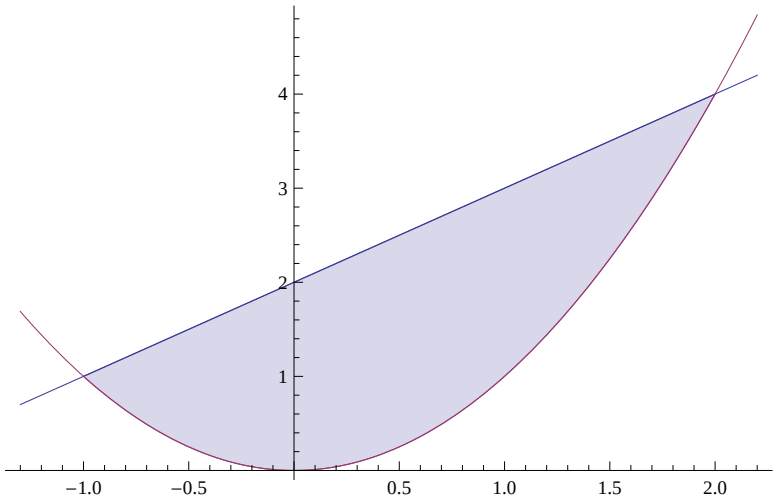
Out[25]= b)

Out[28]= {{x → -1}, {x → 2}}

In[29]:=
```
N[∫_-1^2 (f[x] - g[x]) dx]
p1 := Plot[{f[x], g[x]}, {x, -1.3, 2.2}]
p2 := Plot[{f[x], g[x]}, {x, -1, 2}, Filling → {1 → {2}}]
Show[p1, p2]
```

Out[29]= 4.5

Out[32]=



In[33]:=
```
"c)"
f[x_] := 5 x - x^2
g[x_] := x
Solve[f[x] == g[x], x]
```

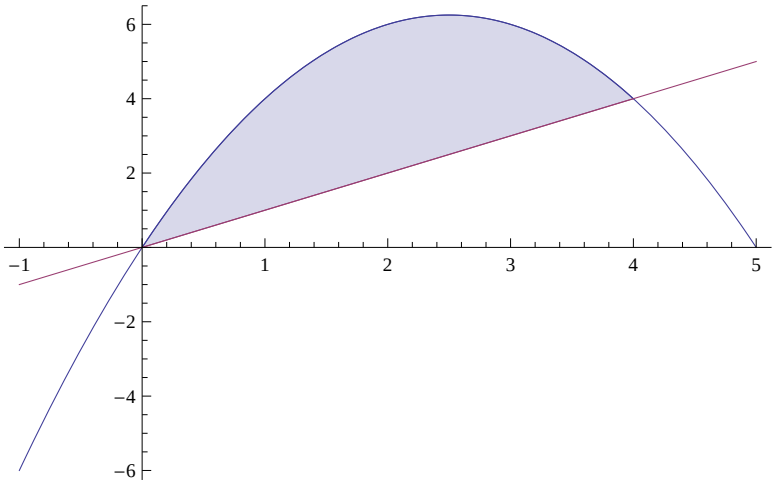
Out[33]= c)

Out[36]= {{x → 0}, {x → 4}}

In[37]:=
```
N[∫_0^4 (f[x] - g[x]) dx]
p1 := Plot[{f[x], g[x]}, {x, -1, 5}]
p2 := Plot[{f[x], g[x]}, {x, 0, 4}, Filling → {1 → {2}}]
Show[p1, p2]
```

Out[37]= 10.6667

Out[40]=

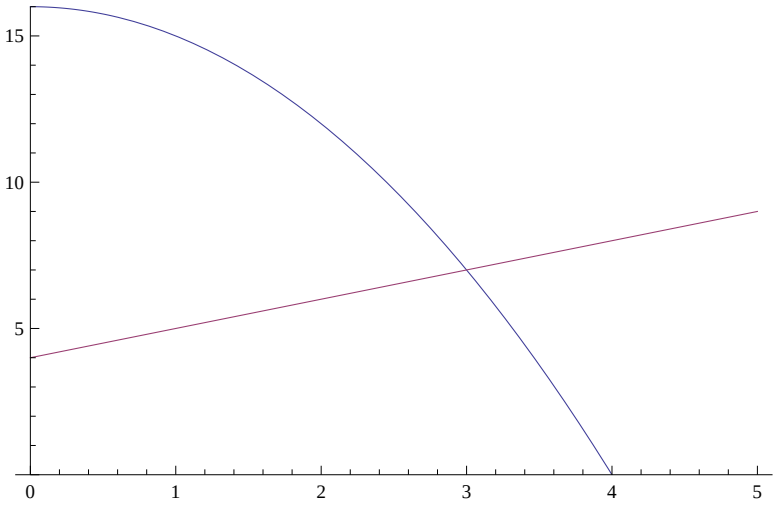


Excedente del consumidor y del productor

In[41]:=
```
"a"
Dem[q_] := 16 - q^2; Ofe[q_] := 4 + q;
Plot[{Dem[q], Ofe[q]}, {q, 0, 5}, PlotRange → {0, 16}]
"Cantidad de equilibrio:"
Solve[Ofe[q] == Dem[q], q]
"Precio de equilibrio:"
Dem[3]
"Superávit Consumidor:"
∫_0^3 (Dem[q] - Dem[3]) dq
"Superávit Productor:"
∫_0^3 (Ofe[3] - Ofe[q]) dq
```

Out[41]= a

Out[43]=



Out[44]= Cantidad de equilibrio:

Out[45]= {{q → -4}, {q → 3}}

Out[46]= Precio de equilibrio:

Out[47]= 7

Out[48]= Superávit Consumidor:

Out[49]= 18

Out[50]= Superávit Productor:

Out[51]= $\frac{9}{2}$

Integrales Impropias

In[52]:=
```
"a)"
Limit[∫_1^a (1/x^3) dx, a → ∞]
```

Out[52]= a)

Out[53]= $\frac{1}{2}$

In[54]:=
```
"b)"
Limit[∫_1^a x^(-3/2) dx, a → ∞]
```

Out[54]= b)

Out[55]= 2

In[56]:=
```
"c)"
Limit[∫_0^a e^(-x) dx, a → ∞]
```

Out[56]= c)

Out[57]= 1