6. Do the following tasks using Mathematica.

(a) Plot the above functions in a single graph for -1 ≤ x ≤ 1.

Hint: Use Abs[ ] function to write absolute value

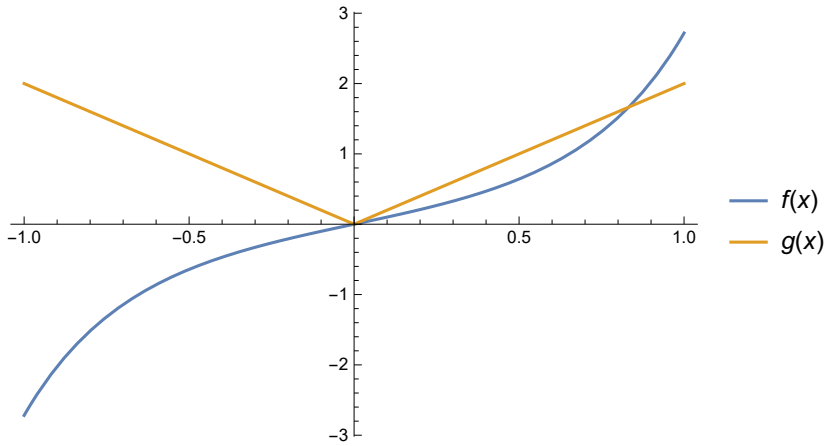
Ans:

In[1]:=
```
f[x_] = x e^x^2;
```

In[2]:=
```
g[x_] = Abs[2 x];
```

In[3]:=
```
Plot[{f[x], g[x]}, {x, -1, 1}, PlotLegends → "Expressions"]
```

Out[3]=



(b) Find the limits of the integration for the area of the region enclosed by f(x) and g(x) for -1 ≤ x ≤ 1.

Hint: Solve equations to find the intersections.

Ans:

In[4]:=
```
Solve[{f[x] == g[x]}]
```

Solve: Inverse functions are being used by Solve, so some solutions may not be found; use Reduce for complete solution information.

Out[4]=
$$\{\{x \to 0\}, \{x \to \sqrt{\text{Log}[2]}\}\}$$

(c) Finally, do the integration to find the area

Ans:

In[5]:=
```
NIntegrate[g[x] - f[x], {x, 0, Sqrt[Log[2]]}]
```

Out[5]=
```
0.193147
```