A1Q1

Consider the function $f(x) = x^2 e^{-x}$. Construct a plot of $[\ f(x), f'(x), f''(x)\ ]$ on the same graph for the domain $0 \le x \le 8$.

Using an option, colour the three functions red, green and bue and include a suitable title. Read the help page for ?plot, options.

```
> restart:
> f := x^2*exp(-x);
```

$$f := x^2 e^{-x} \quad (1)$$

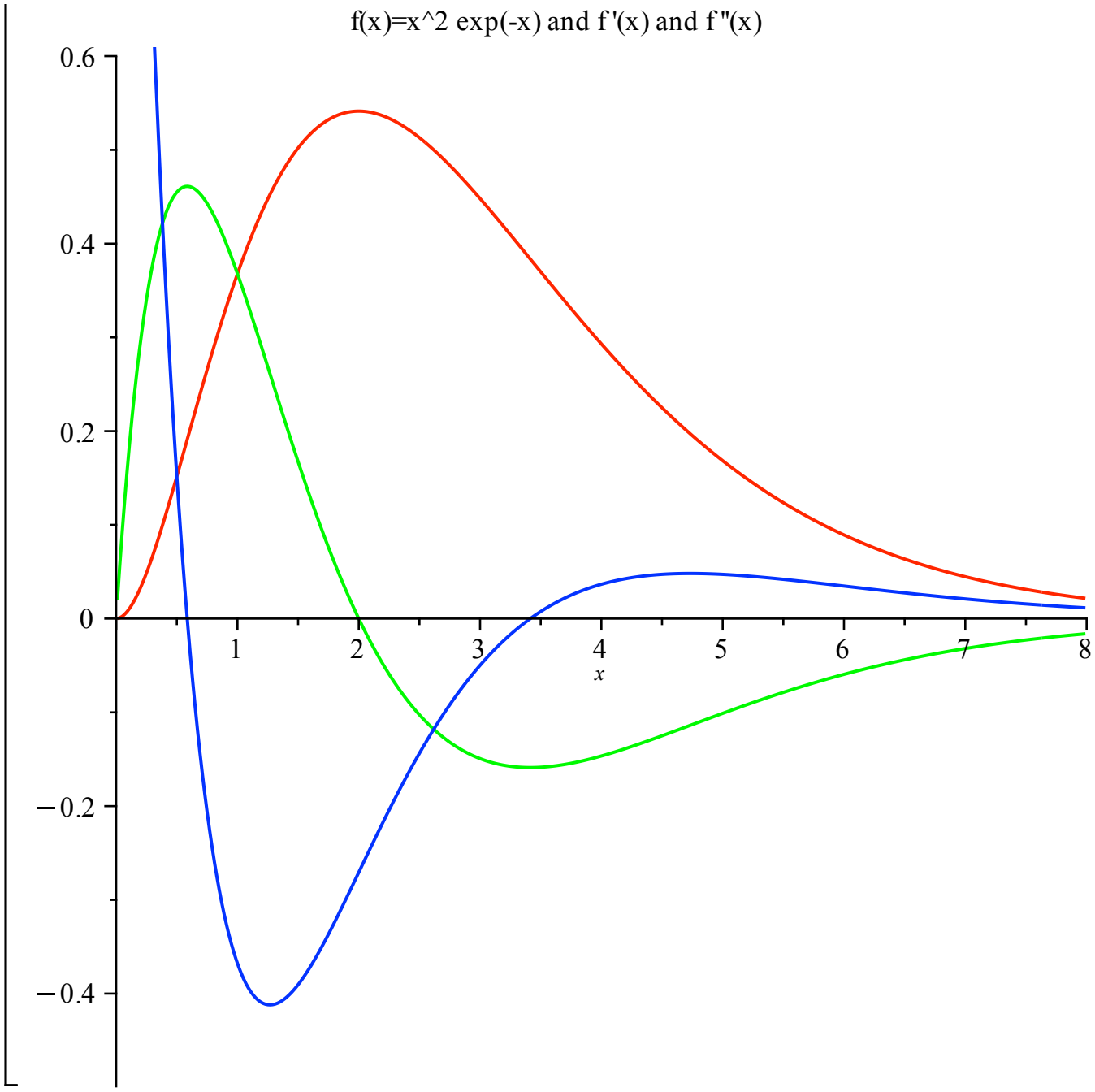
```
> g := diff(f,x);
```

$$g := 2 x e^{-x} - x^2 e^{-x} \quad (2)$$

```
> h := diff(g,x);
```

$$h := 2 e^{-x} - 4 x e^{-x} + x^2 e^{-x} \quad (3)$$

```
> plot([f,g,h],x=0..8, title="f(x)=x^2 exp(-x) and f '(x) and f ''(x)
  ",( color = [red,green,blue]));
```


f(x)=x^2 exp(-x) and f '(x) and f "(x)
0.6
0.4
0.2
0
−0.2
−0.4
1
2
3
4
5
6
7
8
x