Steuermodelle mit größeren Beträgen (Klausur)

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##

```
o:=x->0.0001;
a:=x->1/10000*x;
b:=x->1/30000*(x-4000)+4/10; expand(b(x));
c:=x->6/10;
```

$$x \to 0.0001$$

$$x \to \frac{x}{10000}$$

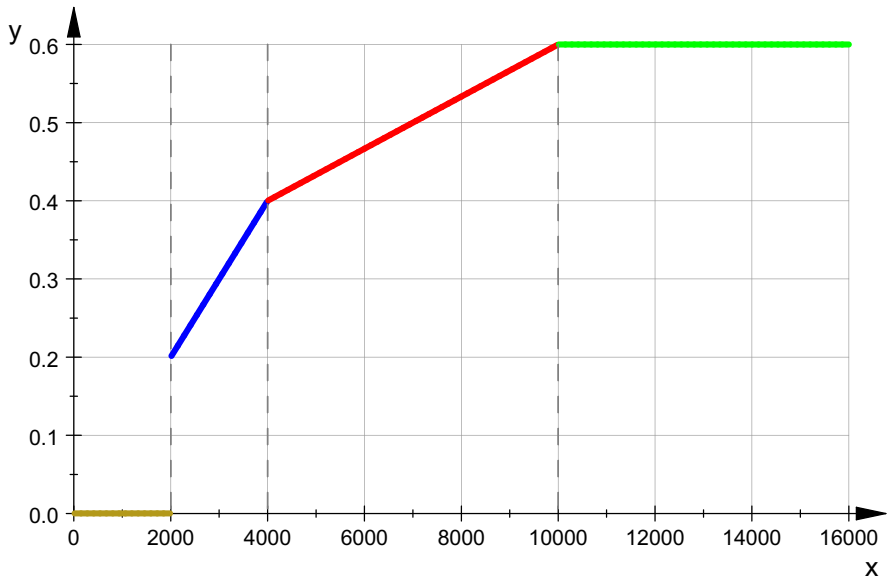
$$x \to \frac{x-4000}{30000}+\frac{2}{5}$$

$$\frac{x}{30000}+\frac{4}{15}$$

$$x \to \frac{3}{5}$$

```
oo:=x->piecewise([x<0,0],[x>=0 and x<2000,o(x)] ):
aa:=x->piecewise([x<0,0],[x>=2000 and x<4000,a(x)] ):
bb:=x->piecewise([x<0,0],[x>=4000 and x<10000,b(x)] ):
cc:=x->piecewise([x<0,0],[x>=10000 ,c(x)] ):
```

```
plotfunc2d(aa(x),bb(x),cc(x),oo(x),x=0..16000, LineWidth=0.8,
           LegendVisible=FALSE, GridVisible=TRUE,
           ViewingBoxYRange=0..0.6)
```



```
a:=x->1/10000*x;
b:=x->1/30000*(x-4000)+4/10; expand(b(x));
c:=6/10;
g:=x->piecewise( [x<2000,0],[2000<=x and x<4000,a(x)],
                             [4000 <=x and x<10000,b(x)],
                             [x>10000,c(x)]);
g(x)
```

$$x \to \frac{x}{10000}$$

$$x \to \frac{x - 4000}{30000} + \frac{2}{5}$$

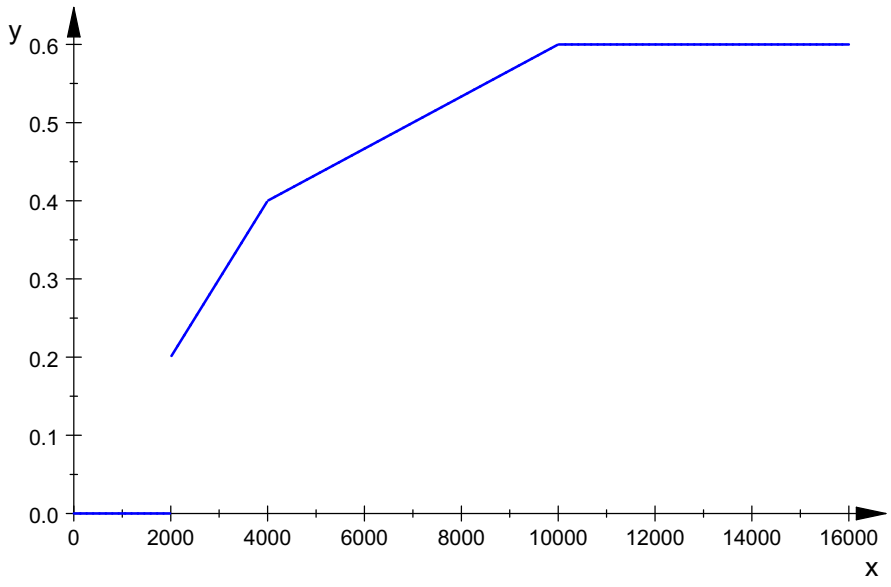
$$\frac{x}{30000} + \frac{4}{15}$$

$$\frac{3}{5}$$

$$x \to \text{piecewise}([x < 2000, 0], [2000 \le x \wedge x < 4000, a(x)], [4000 \le x \wedge x < 10000, b(x)], [$$

$$\begin{cases} \frac{x}{10000} & \text{if } x \in [2000, 4000) \\ 0 & \text{if } x < 2000 \\ \frac{3}{5} & \text{if } 10000 < x \\ \frac{x}{30000} + \frac{4}{15} & \text{if } x \in [4000, 10000) \end{cases}$$

```
plotfunc2d(g(x),x=0..16000)
```



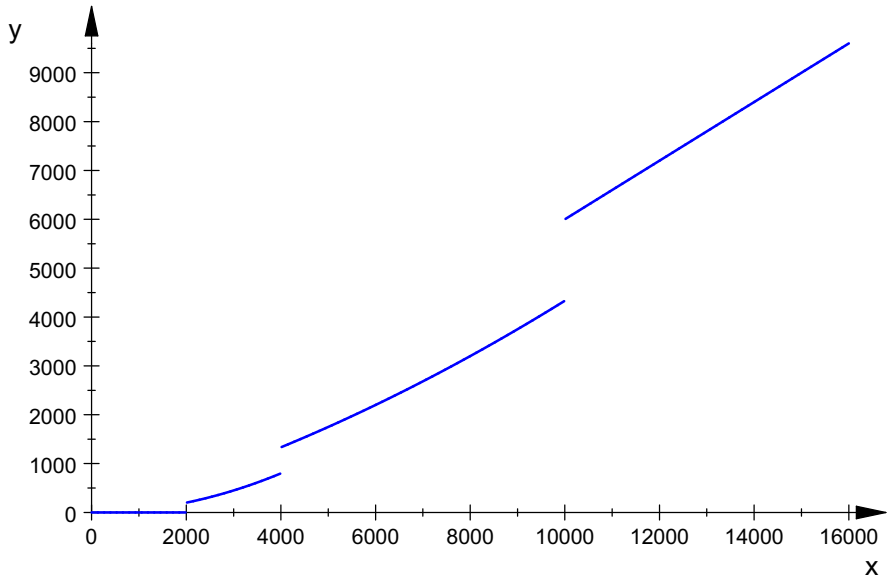

```
s:=x->int(g(x), x);

s(x)
```

```
s(x)
```

$$x \to \int g(x)\, dx$$

$$\begin{cases} \frac{x \cdot (x+16000)}{60000} & \text{if } x \in [4000, 10000) \\ \frac{3 \cdot x}{5} & \text{if } 10000 < x \\ 0 & \text{if } x < 2000 \\ \frac{x^2}{20000} & \text{if } x \in [2000, 4000) \end{cases}$$

```
plotfunc2d(s(x),x=0..16000)
```




```
A:=x->1/20000*x^2+ka;A(x);A(2000);
```

$$x \to \frac{x^2}{20000} + ka$$

$$\frac{x^2}{20000} + ka$$

$$ka + 200$$

```
ka:=solve(A(2000)=0,ka)[1]
```

$$-200$$

```
A(x), A(4000)
```

$$\frac{x^2}{20000} - 200,\ 600$$

```
b(x);
```

```
b(x);
B:=x->1/60000*x^2+4/15*x+kb; B(4000)
```

$$\frac{x}{30000}+\frac{4}{15}$$

$$x \to \frac{x^2}{60000}+\frac{4 \cdot x}{15}+kb$$

$$kb+\frac{4000}{3}$$

```
delete(kb);
kb:=solve(A(4000)=B(4000),kb)[1]
```

$$-\frac{2200}{3}$$

```
B(10000)
```

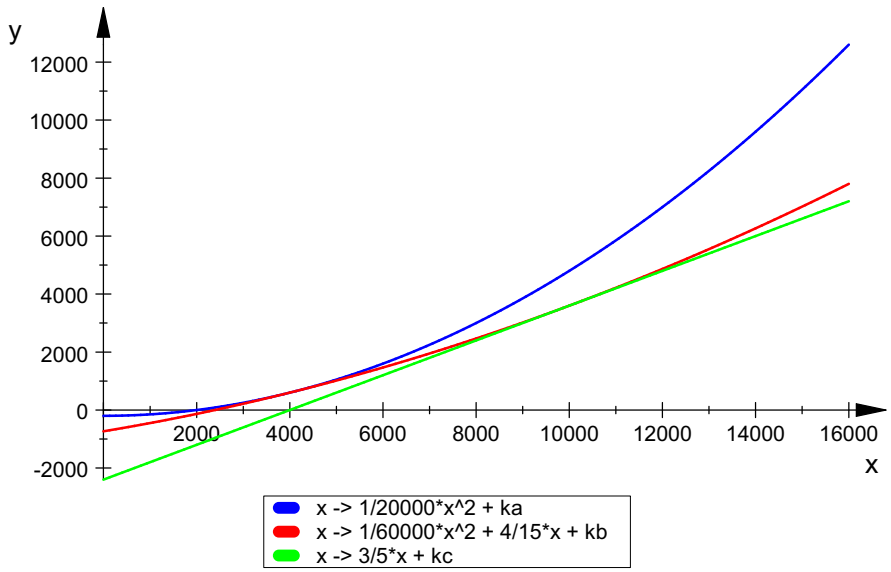
$$3600$$

```
delete(kc)
C:=x->6/10*x+kc;
kc:=solve(C(10000)=B(10000),kc)[1];
```

$$x \to \frac{3 \cdot x}{5}+kc$$

$$-2400$$

```
plotfunc2d(A,B,C,x=0..16000)
```

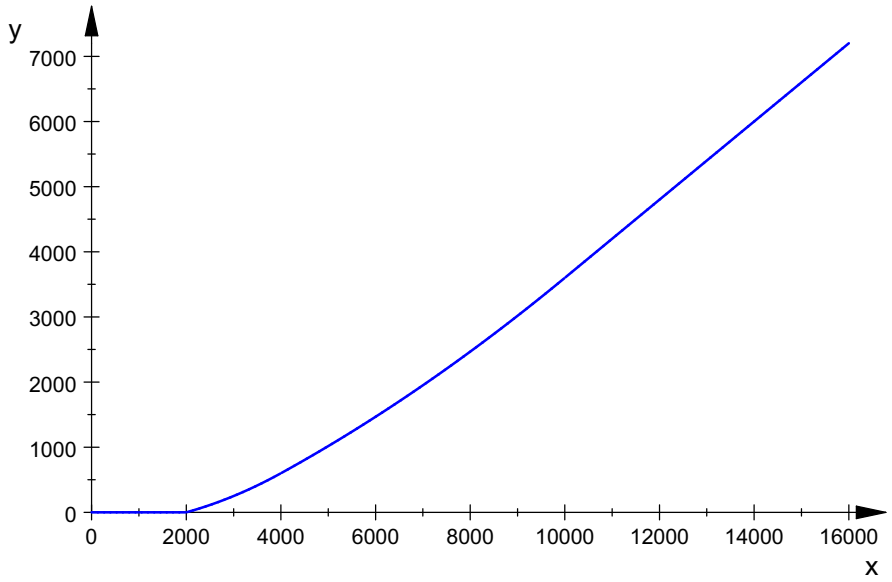



```
s:=x->piecewise([x<2000,0],[x>=2000 and x < 4000,A(x)],
          [x>=4000and x<10000,B(x)],[x>=10000,C(x)])
```

$$x \to \text{piecewise}([x < 2000,\ 0],\ [2000 \le x \wedge x < 4000,\ A(x)],\ [4000 \le x \wedge x < 10000,\ B(x)],$$

$$x \to \text{piecewise}([x < 2000,\ 0],\ [2000 \le x \wedge x < 4000,\ A(x)],\ [4000 \le x \wedge x < 10000,\ B(x)],\ [$$

```
plotfunc2d(s(x),x=0..16000)
```



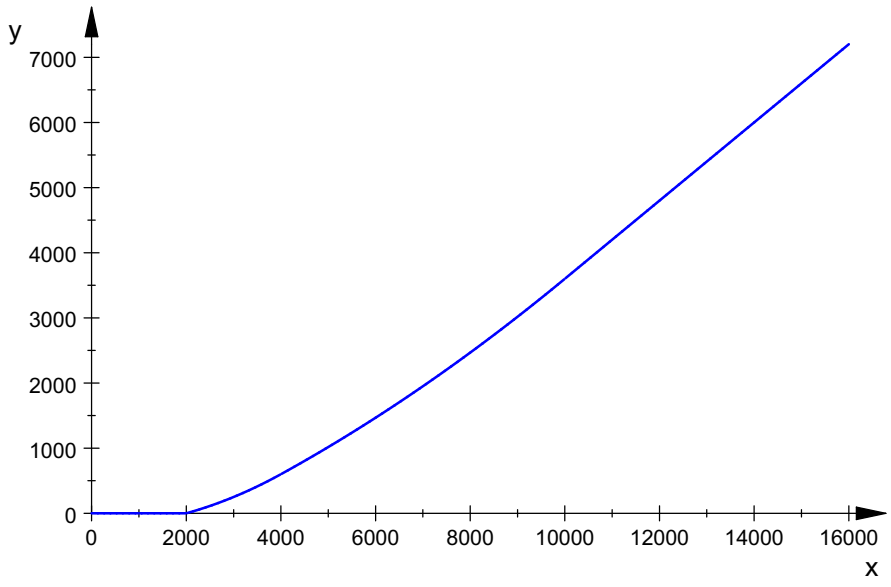

```
s(x)
```

$$\begin{cases} 0 & \text{if } x < 2000 \\ \frac{3 \cdot x}{5} - 2400 & \text{if } 10000 \le x \\ \frac{x^2}{60000} + \frac{4 \cdot x}{15} - \frac{2200}{3} & \text{if } x \in [4000, 10000) \\ \frac{x^2}{20000} - 200 & \text{if } x \in [2000, 4000) \end{cases}$$

```
sg:=plot::Function2d(s(x),x=0..16000)
```

$$\text{plot::Function2d}\left(\begin{cases} 0 & \text{if } x < 2000 \\ \frac{3 \cdot x}{5} - 2400 & \text{if } 10000 \le x \\ \frac{4 \cdot x}{15} + \frac{x^2}{60000} - \frac{2200}{3} & \text{if } x \in [4000, 10000) \\ \frac{x^2}{20000} - 200 & \text{if } x \in [2000, 4000) \end{cases}, x = 0..16000\right)$$

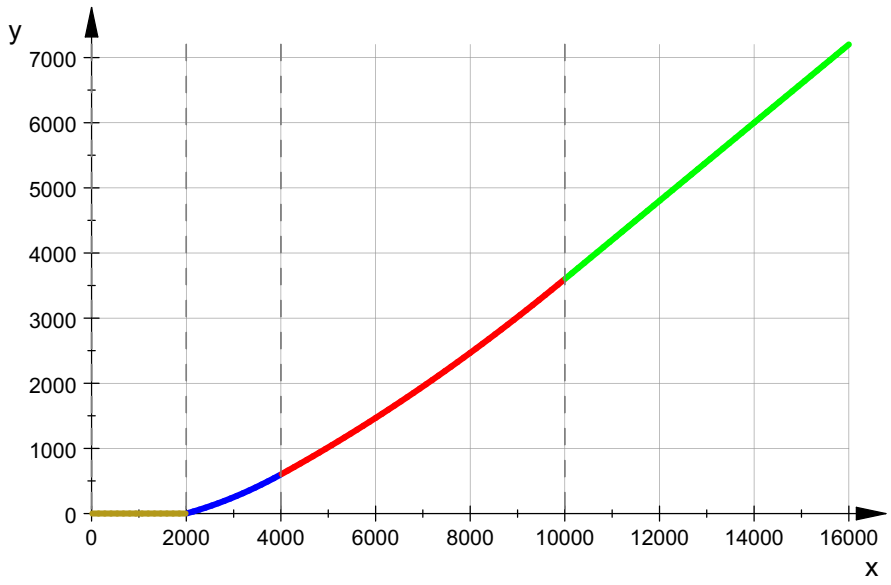
```
plot(sg)
```


```
AA:=x->piecewise([x<0,0],[x>=2000 and x<4000,A(x)] ):
BB:=x->piecewise([x<0,0],[x>=4000 and x<10000,B(x)] ):
CC:=x->piecewise([x<0,0],[x>=10000 ,C(x)] );
```

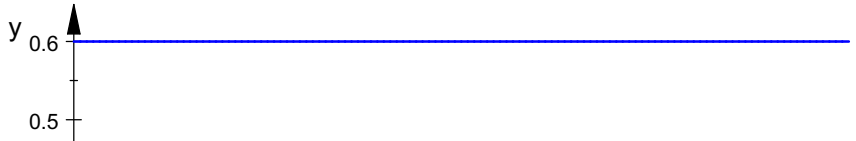
$$x \to \text{piecewise}([x < 0, 0], [10000 \le x, C(x)])$$

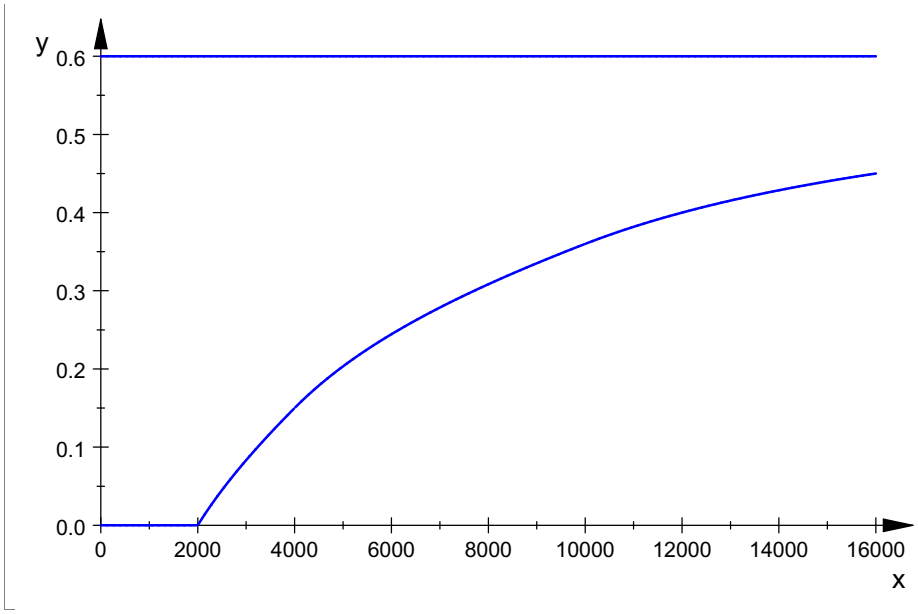
```
plotfunc2d(AA(x),BB(x),CC(x),oo(x),x=0..16000, LineWidth=0.8,
           LegendVisible=FALSE, GridVisible=TRUE )
```



Duchschnittssteuersatz

```
sp:=plot::Function2d(0.6,x=0..16000):
plot(plot::Function2d(s(x)/x,x=0..16000),sp)
```


y
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0
2000
4000
6000
8000
10000
12000
14000
16000
x