

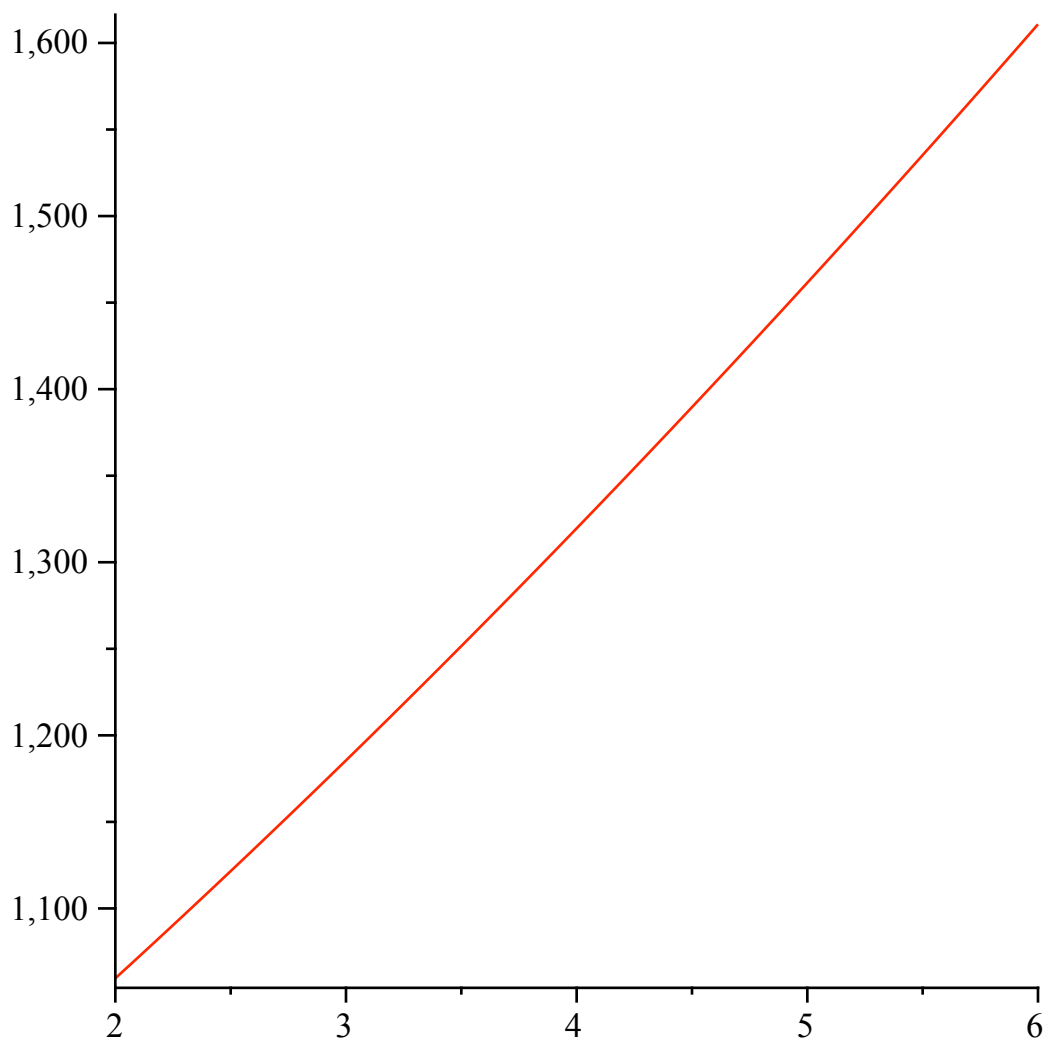
```
> restart,
> # Solution to Problem 2, 2:
```

$$M := x \rightarrow \frac{\left(1 + \frac{x}{1200}\right)^{300} \cdot 250000 \cdot \left(\frac{x}{1200}\right)}{\left(\left(1 + \left(\frac{x}{1200}\right)\right)^{300} - 1\right)};$$

$$M := x \rightarrow \frac{625}{3} \frac{\left(1 + \frac{1}{1200} x\right)^{300} x}{\left(1 + \frac{1}{1200} x\right)^{300} - 1}$$

(1)

```
> plot(M, 2..6);
```

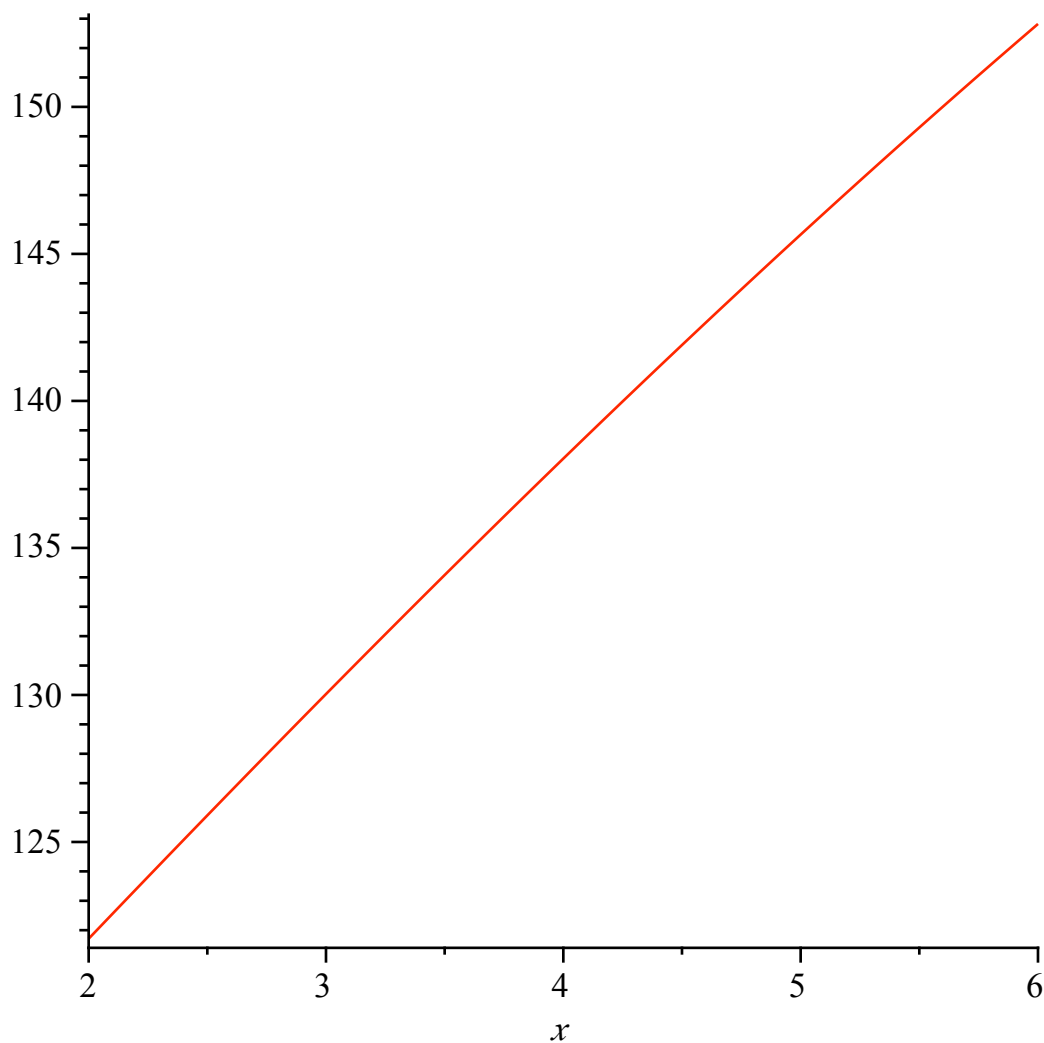


```
> dMdx := diff(M(x), x);
```

(2)

$$dMdx := \frac{625}{12} \frac{\left(1 + \frac{1}{1200}x\right)^{299} x}{\left(1 + \frac{1}{1200}x\right)^{300} - 1} + \frac{625}{3} \frac{\left(1 + \frac{1}{1200}x\right)^{300}}{\left(1 + \frac{1}{1200}x\right)^{300} - 1} - \frac{625}{12} \frac{\left(1 + \frac{1}{1200}x\right)^{599} x}{\left(\left(1 + \frac{1}{1200}x\right)^{300} - 1\right)^2} \quad (2)$$

> `plot(dMdx, x=2..6);`

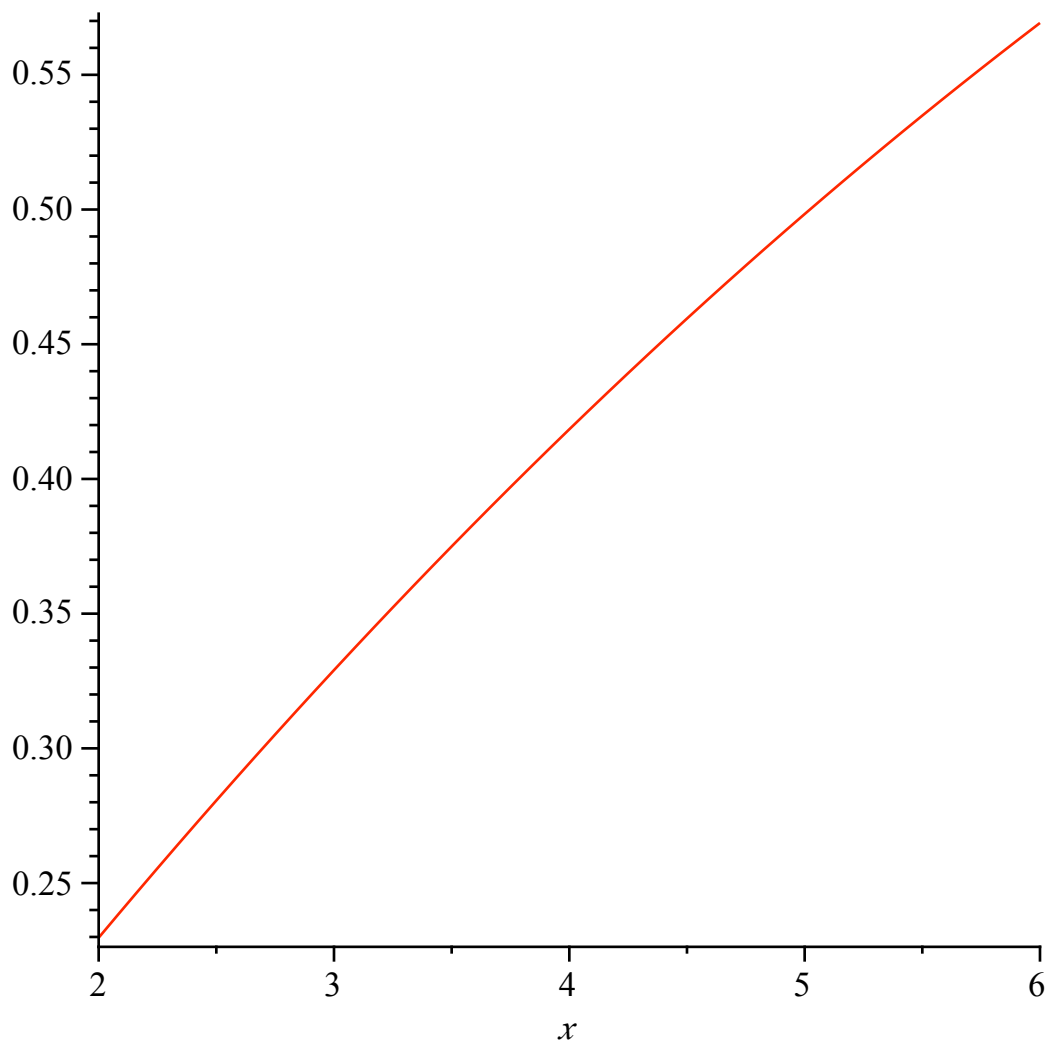


> `sensMx := dMdx·x / M(x);`

$$sensMx := \frac{3}{625} \frac{1}{\left(1 + \frac{1}{1200}x\right)^{300}} \left(\left(\frac{625}{12} \frac{\left(1 + \frac{1}{1200}x\right)^{299} x}{\left(1 + \frac{1}{1200}x\right)^{300} - 1} \right) \right) \quad (3)$$

$$+ \frac{625}{3} \frac{\left(1 + \frac{1}{1200}x\right)^{300}}{\left(1 + \frac{1}{1200}x\right)^{300} - 1} - \frac{625}{12} \frac{\left(1 + \frac{1}{1200}x\right)^{599} x}{\left(\left(1 + \frac{1}{1200}x\right)^{300} - 1\right)^2} \left(\left(1 + \frac{1}{1200}x\right)^{300} - 1 \right)$$

```
> plot(sensMx, x=2..6);
```



```
> subs(x=4.5, sensMx);
```

0.4595293304

```
>
```

(4)