

29. Derivoi x^2+4x .

```
In[62]:= D[x^2 + 4 x, x]
```

```
Out[62]= 4 + 2 x
```

30. Derivoi $x^4-3x-\sin(x)$ kaksi kertaa.

```
In[63]:= D[x^4 - 3 x - Sin[x], {x, 2}]
```

```
Out[63]= 12 x^2 + Sin[x]
```

31. Kappaleen paikka saadaan lausekkeesta $x=40-5t-5t^2$. Mikä on kappaleen kiihtyvyys hetkellä $t=2$?

```
In[64]:= D[40 - 5 t - 5 t^2, {t, 2}]
```

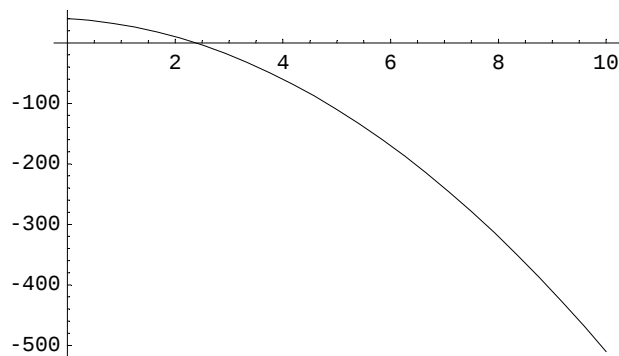
```
Out[64]= -10
```

32. Piirrä edellisen tehtävän paikka ja nopeus ajan funktiona Plot-komennolla samaan kuvaan.

```
In[65]:= nopeus = D[40 - 5 t - 5 t^2, t]
```

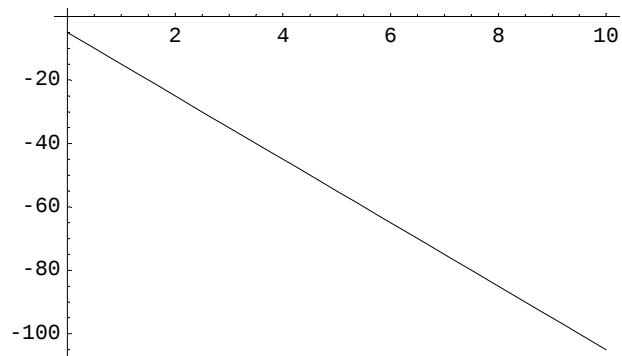
```
Out[65]= -5 - 10 t
```

```
In[67]:= Plot[40 - 5 t - 5 t^2, {t, 0, 10}]
```



```
Out[67]= - Graphics -
```

```
In[68]:= Plot[nopeus, {t, 0, 10}]
```



```
Out[68]= - Graphics -
```

33. Laske funktion $f(x,y)=x^3 y^4$

osittaisderivaatat

$\partial f / \partial x$ ja $\partial f / \partial y$ sekä

$\partial^2 f / \partial x^2$, $\partial^2 f / \partial y^2$, $\partial^2 f / \partial x \partial y$ ja $\partial^2 f / \partial y \partial x$.

```
In[69]:= Clear[f]
```

```
In[70]:= f[x_, y_] := x^3 y^4
```

```
In[71]:= D[f[x, y], x]
```

```
Out[71]= 3 x^2 y^4
```

```
In[72]:= D[f[x, y], y]
```

```
Out[72]= 4 x^3 y^3
```

```
In[73]:= D[f[x, y], {x, 2}]
```

```
Out[73]= 6 x y^4
```

```
In[74]:= D[f[x, y], {y, 2}]
```

```
Out[74]= 12 x^3 y^2
```

```
In[76]:= D[f[x, y], x, y]
```

```
Out[76]= 12 x^2 y^3
```

```
In[77]:= D[f[x, y], y, x]
```

```
Out[77]= 12 x^2 y^3
```