Aufgabe 2

Definition der Teilwege und Berechnungen der Koeffizienten

```
k1 = 1;
s1[t_] := k1 * t^2 ;
s2[t_] := k2 * t + k3;

gleichung1 = (s1[3] == s2[3]);
gleichung2 = ((Evaluate[D[s1[t], t]] /. t → 3) == (Evaluate[D[s2[t], t]] /. t → 3));

loesung = Solve[{gleichung1, gleichung2}, {k2, k3}] // Flatten
```

```
{k2 → 6, k3 → -9}
```

```
s2[t_] := k2 * t + k3 /. loesung;
s2[t]
```

```
-9 + 6 t
```

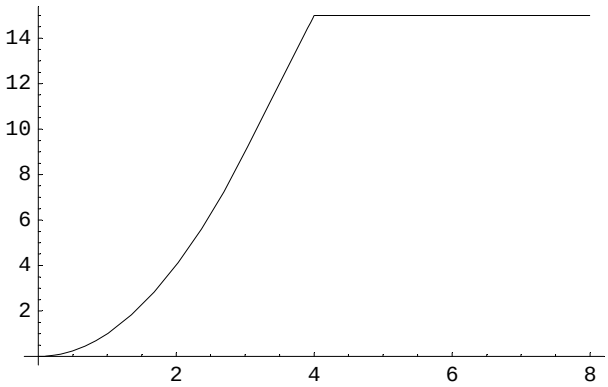
```
s2[4]
```

```
15
```

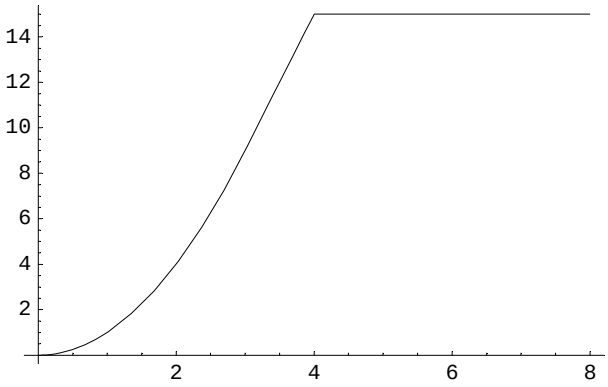
```
s3[t_] := s2[4];
```

1. Zusammengesetzter Weg und Diagramm

```
s[t_ /; t < 3] := s1[t];
s[t_ /; t ≥ 3 && t < 4] := s2[t];
s[t_ /; t ≥ 4] := s3[t];
Plot[s[t], {t, 0, 8}];
```



```
ss[t_] := If[t < 3, s1[t], If[t < 4, s2[t], s3[t]]];
Plot[ss[t], {t, 0, 8}];
```



2. Durchschnittsgeschwindigkeit [m/s]

```
s[8]
```

15

```
s[0]
```

0

```
t8 = 8; t0 = 0;
```

```
vMittel = (s[8] - s[0]) / (t8 - t0)
```

$\frac{15}{8}$

```
N[%]
```

1.875

3. Momentangeschwindigkeiten [m/s]

```
D[s1[t], t] /. t → 2
```

4

```
D[s3[t], t] /. t → 6
```

0

4. Momentanbeschleunigungen [m/s^2]

```
D[s1[t], {t, 2}] /. t → 2
```

2

```
D[s2[t], {t, 2}] /. t → 3.5
```

```
0
```