

ÖVNING Acceleration

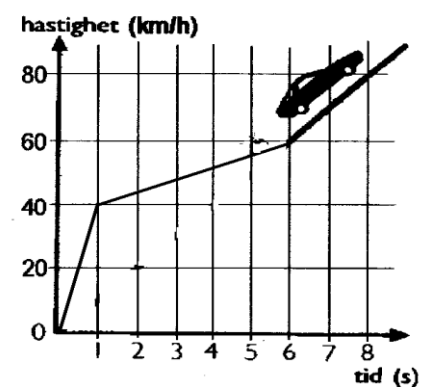
1. Komplettera tabellen

Slut-hastighet	Utgångs-hastighet	Δv = hastighets-förändring	Δt = tids-förändring	a = acceleration
100 km/h	0 km/h		5 s	
	0 km/h		10 s	$\frac{5 \text{ km/h}}{\text{s}}$
	20 km/h		5s	$\frac{5 \text{ km/h}}{\text{s}}$
0 km/h	30 km/h		6 s	
6 m/s	0 m/s		2 s	
50 m/s			3 s	10 m/s^2

2. Beräkna bilens acceleration i grafen under

- intervallet 0 - 1 s
- intervallet 1 - 6 s
- intervallet 6 - 8 s

3. Beräkna bilens medelacceleration i grafen under intervallet 0-8 s. Ange svaret i m/s^2 .



4. En bil bromsar från 42 km/h till stillastående på 3 s. Beräkna accelerationen.

5. En bil accelererar från 5 m/s till 15 m/s på 2 s. Beräkna accelerationen.

ÖVNING Acceleration

1. Komplettera tabellen

$$\Delta v = a \cdot \Delta t$$

$$\Delta t = \frac{\Delta v}{a}$$

$$a = \frac{\Delta v}{\Delta t}$$

slut-hastighet	utgångs-hastighet	Δv = hastighets-förändring	Δt = tids-förlopp	a = acceleration
100 km/h	0 km/h	100 km/h	5 s	$20 \frac{\text{km/h}}{\text{s}}$
50 km/h	0 km/h	50 km/h	10 s	$\frac{5 \text{ km/h}}{\text{s}}$
45 km/h	20 km/h	25 km/h	5 s	$\frac{5 \text{ km/h}}{\text{s}}$
0 km/h	30 km/h	-30 km/h	6 s	$-5 \frac{\text{km/h}}{\text{s}}$
6 m/s	0 m/s	6 m/s	2 s	$3 \frac{\text{m/s}}{\text{s}} = 3 \text{ s}^{-2}$
50 m/s	20 m/s	30 m/s	3 s	10 m/s ²

a) $\Delta v = 40 \text{ km/h} - 0 \text{ km/h} = 40 \text{ km/h}$

$\Delta t = 1 \text{ s}$

$a = ?$

$$a = \frac{\Delta v}{\Delta t}$$

$$a = \frac{40 \text{ km/h}}{1 \text{ s}} = 40 \frac{\text{km/h}}{\text{s}}$$

b) $\Delta v = 60 \text{ km/h} - 40 \text{ km/h} = 20 \text{ km/h}$

$\Delta t = 6 \text{ s} - 1 \text{ s} = 5 \text{ s}$

$a = ?$

$$a = \frac{20 \text{ km/h}}{5 \text{ s}} = 4 \frac{\text{km/h}}{\text{s}}$$

c) $\Delta v = 80 \text{ km/h} - 60 \text{ km/h} = 20 \text{ km/h}$

$\Delta t = 8 \text{ s} - 6 \text{ s} = 2 \text{ s}$

$a = ?$

$$a = \frac{20 \text{ km/h}}{2 \text{ s}} = 10 \frac{\text{km/h}}{\text{s}}$$

③ $\Delta v = 80 \text{ km/h} - 0 \text{ km/h} = 80 \text{ km/h}$

$\Delta t = 8 \text{ s} - 0 \text{ s} = 8 \text{ s}$

$a = ?$

$$a = \frac{80 \text{ km/h}}{8 \text{ s}} = 10 \frac{\text{km/h}}{\text{s}}$$

$$80 \text{ km/h} = 22,22 \dots \text{ m/s}$$

$$a = \frac{22,22 \dots \text{ m/s}}{8 \text{ s}} = 2,8 \frac{\text{m/s}}{\text{s}} = 2,8 \text{ m/s}^2$$

④ $\Delta v = 0 \text{ km/h} - 42 \text{ km/h} = -42 \text{ km/h}$

$\Delta t = 3 \text{ s}$

$a = ?$

$$a = \frac{-42 \text{ km/h}}{3 \text{ s}} = -14 \frac{\text{km/h}}{\text{s}}$$

⑤ $\Delta v = 15 \text{ m/s} - 5 \text{ m/s} = 10 \text{ m/s}$

$\Delta t = 2 \text{ s}$

$a = ?$

$$a = \frac{10 \text{ m/s}}{2 \text{ s}} = 5 \frac{\text{m/s}}{\text{s}} = 5 \text{ m/s}^2$$