



1(2p) $v = 180 \text{ km/h} = 180 / 3,6 \text{ m/s} = 50,0 \text{ m/s}$
 $s = 20\text{m}$
 $t = ?$

(4p) $t = \frac{s}{v} = \frac{20 \text{ m}}{50 \text{ m/s}} = \mathbf{0.40 \text{ s}}$

2 $v = ?$
 $s = 500\text{m}$
 $t = 38,0\text{s}$

(4p) $v_{gem} = \frac{s}{t} = \frac{500 \text{ m}}{38,0 \text{ s}} = 13,2 \text{ m/s}$

$v = 14 \text{ m/s}$
 $s = 500\text{m}$
 $t = ?$

(4p) $t = \frac{s}{v} = \frac{500 \text{ m}}{14 \text{ m/s}} = \mathbf{36 \text{ s}}$

3

(4p) $v = ?$
 $s = 14 \text{ km}$
 $t = 37 \text{ min} = 37/60\text{h}$
 $v = \frac{s}{t} = \frac{14\text{km}}{37/60\text{h}} = 22,7 \text{ km/h} = 23\text{km/h}$

4 a) Lengte man is 8.5 cm
Afstand bal = 2 cm

(2p) Schaal $180 / 8.5 = 21$ 1 : 21
 $S_{bal} = 21 \times 2 = 42 \text{ cm}$

b) De snelheid op de grond is momentaan
Bij benadering is dat de laatste twee plaatjes

(4p) $v = ?$
 $s = 42 \text{ cm} = 0,42 \text{ m}$
 $t = 0,125 \text{ sec}$
 $v = \frac{s}{t} = \frac{0.42 \text{ m}}{0.125 \text{ s}} = 3,36 \frac{\text{m}}{\text{s}} = 3,4\text{m/s}$

c) $S_{bal} = 21 \times 6,1 = 128 \text{ cm} = 1,3 \text{ m}$

(4p) $v = ?$
 $s = 1,3 \text{ m}$
 $t = 4 \times 0,125 \text{ sec} = 0,500 \text{ sec}$
 $v = \frac{s}{t} = \frac{1,3\text{m}}{0,500\text{sec}} = 2,6\text{m/s}$

5

$$s_{auto} = 80361 - 80230 = 131 \text{ km}$$

$$s_{station} = 0 \text{ km}$$

$$s_{trein} = 530 \text{ km}$$

$$s_{lopen} = 400 \text{ m} = 0,4 \text{ km}$$

$$s_{metro} = 23 \text{ km}$$

$$8:43 = 8 \frac{43}{60} \text{ h} = 8,72 \text{ h} \quad 10:04 = 10 \frac{4}{60} \text{ h} = 10,07 \text{ h}$$

$$t_{auto} = 10,07 - 8,72 = 1,35 \text{ h} = 1 \text{ h } 21 \text{ min}$$

$$t_{station} = 26 / 60 \text{ h} = 0,43 \text{ h}$$

$$t_{trein} = 2 \text{ h } 30 \text{ min} = 2,5 \text{ h}$$

$$t_{lopen} = 5 \text{ min} = 5 / 60 \text{ h} = 0,083 \text{ h}$$

$$t_{metro} = 21 \text{ min} = 21 / 60 \text{ h} = 0,35 \text{ h}$$

(6p)
$$v_{auto} = \frac{s}{t} = \frac{131 \text{ km}}{1,35 \text{ h}} = 97,04 \text{ km / h}$$

$$v_{station} = \frac{s}{t} = \frac{0 \text{ km}}{0,43 \text{ h}} = 0 \text{ km / h}$$

$$v_{Trein} = \frac{s}{t} = \frac{530 \text{ km}}{2,5 \text{ h}} = 212 \text{ km / h}$$

$$v_{lopen} = \frac{s}{t} = \frac{0,4 \text{ km}}{5 / 60 \text{ h}} = 4,8 \text{ km / h}$$

$$v_{metro} = \frac{s}{t} = \frac{23 \text{ km}}{0,35 \text{ h}} = 65,71 \text{ km / h}$$

(6p)
$$s_{tot} = s_1 + s_2 + s_3 + s_4 + s_5 = 131 + 0 + 530 + 0,4 + 23 = 684,4 \text{ km}$$

$$t_{tot} = t_1 + t_2 + t_3 + t_4 + t_5 = 1,35 \text{ h} + 0,43 \text{ h} + 2,5 \text{ h} + 0,083 \text{ h} + 0,35 \text{ h} = 4,71 \text{ h}$$

$$v_{gem} = ?$$

$$v_{gem} = \frac{s}{t} = \frac{684,4 \text{ km}}{4,71 \text{ h}} = 145 \text{ km / h}$$