13)

$s_1 = 0.10\,m/s$

$a = 5.5\,m/s^2$

$s_2 = 3.5\,m/s$

$t = ?$

$s_2 = s_1 + at$

$-s_1 \quad -s_1$

$\frac{s_2 - s_1}{a} = \frac{at}{a}$

$\frac{s_2 - s_1}{a} = t$

$\frac{3.5\,m/s - 0.10\,m/s}{5.5\,m/s^2} = t$

$0.625 = t$

12) $a = 2.0\ m/s^2$

$t = 8.0\ s$

$S_2 = 26\ m/s$

$S_1 = ?$

$S_2 = S_1 + at$

$-at \quad -at$

$S_2 - at = S_1$

$26\ m/s - (2.0\ m/s^2)(8.0\ s) = S_1$

$26\ m/s - 16\ m/s = S_1$

$10.\ m/s = S_1$

14)

$v_1 = 95\ m/s$

$a = -4.40\ m/s^2$

↑ slowing down

$v_2 = 0\ m/s$

$t = ?$

$v_2 = v_1 + at$

$0 = v_1 + at$

$\frac{-v_1}{a} = \frac{at}{a}$

$\frac{-v_1}{a} = t$

$\frac{-(95\ m/s)}{-4.40\ m/s^2} = t$

$22\ s = t$

$2\ m/s \qquad 1\ m/s$

$-1\ m/s^2$

A car accelerates from rest to a final speed of 6.0m/s in a time of 3.0s. What is the acceleration of the car?

$s_2 = 6.0$

$s_1 = 0$

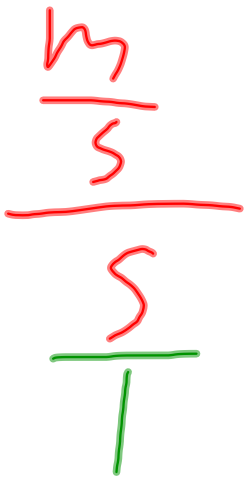
$a = ?$

$t = 3.0$

$$\frac{s_2 - s_1}{t} = a$$

$$\frac{6.0 - 0}{3.0} = 2 \text{ m/s}^2$$

2.0 m/s^2



A car is hit from behind by a large truck. The impact lasts for 0.10s and causes an acceleration of 45m/s^2 of the car. What was the car's change in speed?

$S = a \times t$

$= 0.10\,s \times 45\,m/s^2$

$= 4.5\,m/s$

$\frac{m}{s \cdot s} \times s$

$\frac{m \cdot s}{s \cdot s}$

A duck, resting on the water, takes off and reaches a speed of 35km/hr in 4.0min. What was the acceleration of the duck?

$t_1 = 4.0\,min$

$S = 35\,km/hr$

$a = ?$

$a = \frac{35\,km/hr}{4.0\,min}$

$4.0\,min \times 60 = 240$

$\frac{35\,km/hr}{240\,hr} = 0.15\,km/hr$

$\frac{4.0\,min}{60} = 0.067$

$= 520\,km/hr^2$!

While pulling a barge, a tugboat accelerates at 0.10m/s^2 to produce a 5.0m/s change in speed of the barge. How long did this take?

$t = ?$ $\quad t = 5.0\,m/s$ ✓

✓A $\quad 0.10\,m/s^2$

$= 50.\,s$

✓

✓3

A flea can jump an amazing 130 times its own height. This is achieved by a phenomenal acceleration of about 1.5km/s^2 over a time of 1.0ms. What is the final speed of the flea at the end of the 1.0ms?

$1\,ms = 0.0010\,s$