Acceleration = (final v - initial v) /time

$a = (v_f - v_i)/t$

Force = mass . acceleration

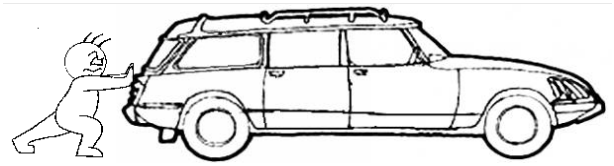
F = m .a

Work = Force . distance

W = F . d

Power = Energy / time

P = E / t



I'm pushing a car with a force of 200 N and spend 12,000 J in energy. How far did I go?

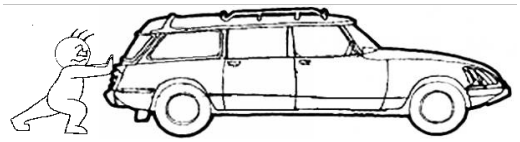
① $F = 200\,N$ $W = 12{,}000\,J$

d : ?

② $W = F \cdot d$

③ $12{,}000 = 200 \cdot d$

④ $d = \frac{12{,}000}{200} = 60\,m$



The speedometer indicates that the speed after this push is 10.8 km/h (3 m/s). The car has a mass of 2,000 kg. For how much time did I push?

① $F = 200N$ $m = 2{,}000\ kg$ $a = ?$

② $F = m \cdot a$

③ $200 = 2{,}000 \cdot a$

④ $0.1\ m/s^2$ ⑤ $200 = 2000 \cdot 0.1$

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① $a = 0.1\ m/s^2$ $V_f = 3$ m/s

② $a = \frac{v_f - v_0}{t}$

③ $0.1 = \frac{3-0}{t}$

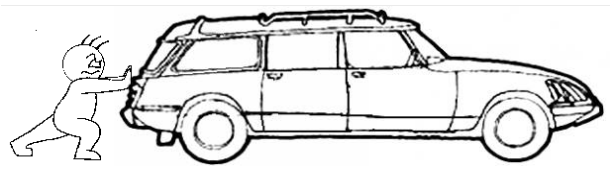
④ $t \times 0.1 = \frac{3-0}{t} \times t$

$\frac{.1t}{.1} = \frac{3}{.1}$

$t =$ 30 SECONDS

⑤ $a = \frac{v_f - v_0}{t}$

$a = \frac{3-0}{30} = .1$ ✓



What amount of power was I using while pushing this car?

① $W = E = 12{,}000\ J$ $t = 30\ s$

② $P = \frac{E}{t}$ Watts (W)

③ $P = \frac{12{,}000\ J}{30\ s}$

④ $P = 400\ W$

⑤ $400 \times 30 = 12{,}000\ J$

Car: 80kW

80,000 W

READ THE PROBLEM:

1) FIND a USING $a = \frac{v_f - v_0}{t}$

2) FIND F USING $F = m \times a$

3) FIND W USING $W = F \times d$

TODAY'S PROBLEM:

1) Find d using $W = F \times d$

2) Find a using $F = m \times a$

3) Find t using $a = \frac{V_F - V_0}{t}$

4) Find P using $P = \frac{W}{t} = \frac{E}{t}$

SOLIDWORKS DRAWING
due : Friday

Permission slip + fee
due : Wednesday