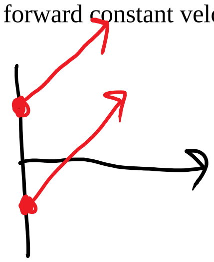
Graphs practice

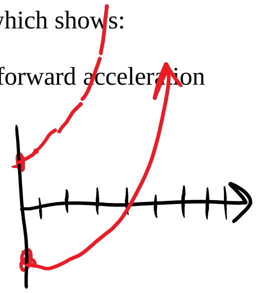
Monday, October 24, 2011 1:55 PM

Sketch a displacement vs time graph which shows:

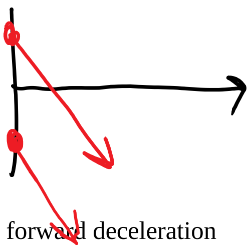
a) forward constant velocity



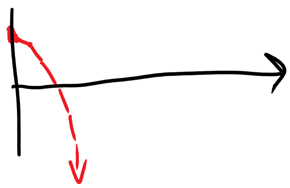
c) forward acceleration



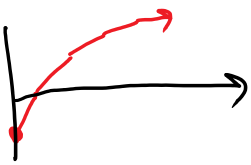
b) backward constant velocity



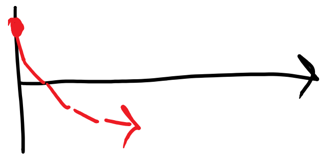
d) backward acceleration



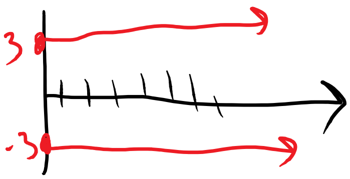
e) forward deceleration



f) backward deceleration

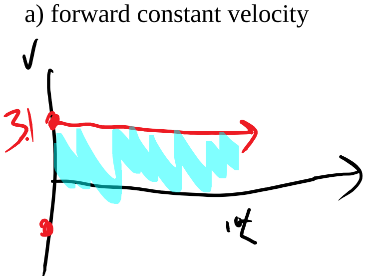


g) object at rest

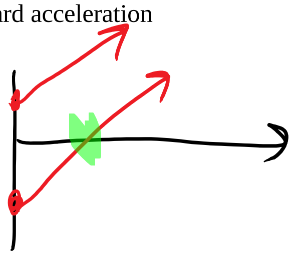


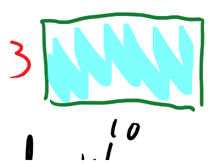
Sketch a velocity vs time graph which shows

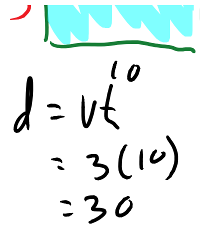
a) forward constant velocity



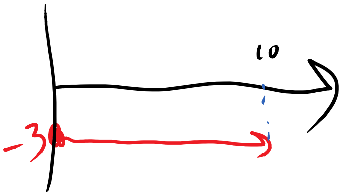
b) forward acceleration



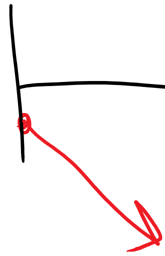




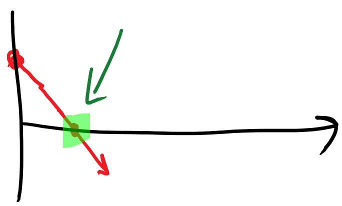
c) backward constant velocity



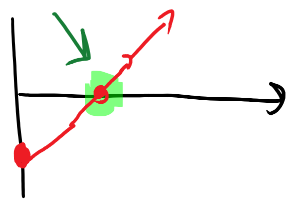
d) backward acceleration



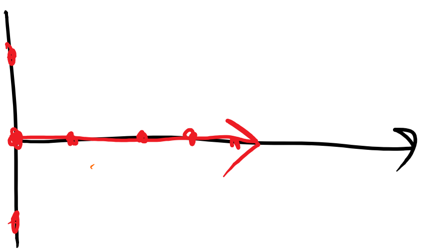
e) forward deceleration



f) backward deceleration



g) object at rest



V_o

Kinematics is the study of motion using equations. There are 4 kinematic equations:

i) $d = 1/2\,(V_f + V_o)\,t$ this is a special case of $\frac{\Delta d}{\Delta t} = V_{ave}$

$$d = \frac{V_f + V_o}{2}\,t \qquad \boxed{d = vt}$$

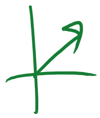
when V is not constant.

$t(s)$

ii) $at = V_f - V_o$ this is a special case of $\frac{\Delta V}{\Delta t} = a$

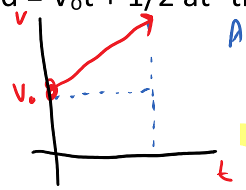
$v = at$

$y = mx + b$



D
slope ↓ ↑ area
V
slope ↓ ↑ area
a

iii) $d = V_o t + 1/2\,at^2$ this is the formula for the area of a v vs t graph



Area = □ + Δ

$d = lw + \frac{bh}{2}$

$v = at$

$$d = V_o t + \frac{vt}{2} = V_o t + \frac{[at]t}{2} = V_o t + \frac{at^2}{2}$$

iv) $Vf^2 = Vo^2 + 2\,a\Delta d$ this is a special case of the Law of Conservation of Energy

$d = vt$ $\qquad$ $v = at$

$d = \left(\frac{V_f + V_i}{2}\right)t \qquad V_f - V_i = at$

Do 1 -4 p. 44

$$\frac{2d}{V_f + V_i} = t \quad = \quad t = \frac{V_f - V_i}{a}$$

$$\frac{2d}{V_f + V_i} = \frac{V_f - V_i}{a}$$

$$2ad = (V_f + V_i)(V_f - V_i)$$

$$2ad = V_f^2 - V_f V_i + V_f V_i - V_i^2$$

$$2ad + V_i^2 = V_f^2$$

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