Acceleration Assignment

Equations

Acceleration = Final velocity - Initial velocity

Time = Final Velocity - Initial Velocity

Acceleration

- The Concorde jetliner achieves a lift-off speed of 112m/s in 20.0s, starting from rest.
 What is the acceleration?
- 2. A motorboat accelerated from rest to a final speed of 6.0m/s in a time of 3.0s. What is the acceleration of the motorboat?

$$V_{i} = 0 \text{ m/s}$$
 $d = V_{f} - V_{i}$
 $V_{f} = 6.0 \text{ m/s}$
 $t = 3.0 \text{ s}$
 $d = 0.0 \text{ m/s}$
 $d = 0.0 \text{ m/s}$

3. A bottle-nosed dolphin is cruising along at 2.2m/s, and accelerates to 9.7m/s in 15s. What is the dolphin's acceleration?

$$\begin{array}{lll}
Vi = 2 \cdot 2m/s & \overline{\alpha} = V_f - V_i \\
V_f = 9.7m/s & \overline{t} \\
E = 15s & = 9.7m/s - 2.2m/s = 7.5m/s = 0.5m/s^2 \\
A driver is transling at 120-11.$$

4. A driver is traveling at 12.0m/s, and sees a light turn red. The driver applies the brakes, and the car accelerates at -6.20m/s² until it stops. How long does it take the car to stop?

Vi = 12.0m/s

Vf = 0m/s

$$\frac{d}{d} = \frac{\Delta V}{d}$$

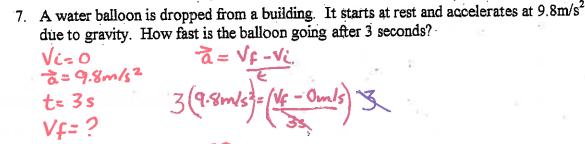
$$\frac{d}{d} = \frac{-6.20m/s^2}{-6m/s^2} = \frac{-12.0m/s}{-6m/s^2} = 1.94s$$
The velocity of a twice of section of the section of

5. The velocity of a train is 26.4m/s. At an acceleration of -1.50m/s², how much time is required for the train to decrease its velocity to 9.72m/s?

$$Vi = 26.4 m/s$$
 $Vf = 9.70 m/s$
 $a = -1.50 m/s^2$
 $b = \frac{4.72 m/s - 26.4 m/s}{-1.50 m/s^2} = \frac{-16.68 m/s}{-1.50 m/s^2} = 11.12 s$
 $b = \frac{1.12 s}{-1.50 m/s^2}$

6. A skier, starting from rest, accelerates at 1.6m/s². How fast is the skier going after 5.0s?

$$\begin{array}{ll}
Vi = 0m/s & \vec{a} = V_{\xi} - Vi \\
\vec{a} = 1.6m/s^2 & t \\
t = 5.0s & 5 & (1.6m/s) = V_{\xi} - 0m/s \\
Vf = ? & 8m/s = V_{\xi}
\end{array}$$



3. A roller coaster car rapidly picks up speed as it rolls down a slope. As it starts down the slope, its speed is 4 m/s. But 3 seconds later, at the bottom of the slope, its speed is 22 m/s. What is its average acceleration?

$$V_{i} = 4mls$$
 $d = \Delta v$
 $V_{f} = 22mls$ $= 22-4 = 18 = 6m/s^{2}$
 $t = 3s$

29.4m/s = Ve m

2. A cyclist accelerates from 0 m/s to 8 m/s in 3 seconds. What is his acceleration? Is this acceleration higher than that of a car which accelerates from 0 to 30 m/s in 8 seconds?

a)
$$Vi = 0mk$$

$$Vf = 8mls$$

$$t = 3s$$

$$= \frac{8}{3}$$

$$= \frac{8}{3}$$

$$= \frac{30}{4}$$

$$= \frac{30}{4$$

13. A car advertisement states that a certain car can accelerate from rest to 70 km/h in 7 seconds. Find the car's average acceleration.

Vi=0km/h
$$\vec{a} = \Delta V$$

Vf=70km/h \vec{t}
 $t=7s$ $= \frac{70 \text{ km/h}}{7 \text{ s}}$
 $\vec{a} = ?$ $= 70 \text{ km/h/s}$

14. A lizard accelerates from 2 m/s to 10 m/s in 4 seconds. What is the lizard's average acceleration?

occleration?
$$a = \Delta v$$
 $Vi = 2m/s$
 $Vf = 10m/s$
 $t = 4s$
 $t = 2m/s$
 $t = 2m/s^2$

12. If a Ferrari, with an initial velocity of 10 m/s, accelerates at a rate of 50 m/s/s for 3 seconds, what will its final velocity be?

What will its final velocity be?

$$\vec{a} = \frac{\Delta V}{E}$$
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 $\vec{a} = \frac{\Delta$