Name__*Answers*____

Acceleration BookWork Section 2-2 (odds academic, all honors.. check book for answers!)
D=Vavg*T Vavg= (Vi+Vf)/2 A= (Vf-Vi)/T
New formulas from other definitions:
$D = Vi*T + \frac{1}{2}*A*T^2$ and $Vf^2 = Vi^2 + 2*A*D$

Pg 55
1) A car with an intial speed of 23.7 km/hr accelerates at a uniform rate of 0.92 m/s^2 for 3.6 sec. Find the final speed and displacement of the car during this time.
Vi= 23.7 km/hr = 23700 m/3600 sec = 6.583 m/s=Vi
A = 0.92 m/s^2, T= 3.6 sec, D = ???? no Vf

Equation 4: $D = Vi\,T + 1/1\,A\,T^2$
$D = (6.5583)*(3.6) + \frac{1}{2}*(.92)*(3.6)^2$
$D= 23.6999 + 5.9616$
$D= 29.66\ m$

2) An automobile with an initial speed of 4.30 m/s accelerates at the rate of 3 m/s^2 . Find the final speed and displacement after 5 seconds.
Vi= 4.3 m/s=Vi
A = 3 m/s^2, T= 5 sec, D = ?????, no Vf

Equation 4: $D = Vi\,T + 1/1\,A\,T^2$
$D = (4.3)*(5) + \frac{1}{2}*(3)*(5)^2$
$D= 21.5 + 37.5$
$D= 59\ m$

3) A car starts from rest and travels for 5 seconds with a uniform acceleration of $-1.5\ m/s^2$. What is the final velocity of the car.? How far does the car travel in this time interval?
Vi= 0 m/s=Vi
A = 1.5 m/s^2, T= 5 sec, Vf=????, D=???
Equation 3: Vf= Vi + AT Vf = 0 + (1.5)(5) = 7.5 m/s=Vf
Equation 4: $D = Vi\,T + 1/1\,A\,T^2$
$D = (0)*(3.6) + \frac{1}{2}*(1.5)*(5)^2$
$D= 0 + 18.75$
$D= 18.75\ m$

4) A driver of a car traveling at -15 m/s applies the brakes, causing a uniform acceleration of $+2\ m/s^2$. If the brakes are applied for 2.5 seconds what is the velocity of the car at the end of the braking period? How far has the car moved during the braking period?

Vi= -15 m/s=Vi
A = +2 m/s^2, T= 2.5 sec, Vf=????, D=???
Equation 3: Vf= Vi + AT Vf = -15 + (2)(2.5) = -10 m/s=Vf
Equation 4: D = Vi T + 1/1 A T^2
D = (-15)*(2.5) + ½*(2)*(2.5)^2
D= -37.5 + 6.25
D= -31.25 m

Name_***Answers***_____

Acceleration BookWork Section 2-2 (odds academic, all honors.. check book for answers!)
D=Vavg*T Vavg= (Vi+Vf)/2 A= (Vf-Vi)/T
New formulas from other definitions:
D= Vi*T + ½ *A*T^2 and Vf^2 = Vi^2 + 2*A*D

Pg 58

1) Find the velocity after the stroller (from page before) has traveled 6.32 m.
(A= .5 m/s^2 , Vi=0)
D= 6.32 m, A= .5 m/s^2 , Vi=0 Vf=????, no T
Use Equation 5 Vf^2 = Vi^2 + 2*A*D
Vf^2 = 0^2 + 2*.5*6.32
Vf^2 = 0+ 6.32
Vf = +2.514 m/s

2. A car traveling initially at +7.0 m/s accelerates at the rate of +0.80 m/s^2 for a distance of 245 m.
a) What is its velocity at the end of the acceleration?
D= 245 m, A= .8 m/s^2 , Vi=7 m/s Vf=????, no T
Use Equation 5 Vf^2 = Vi^2 + 2*A*D
Vf^2 = 7^2 + 2*.8*245
Vf^2 = 49+ 392=441
Vf = +21 m/s

b) What is its velocity after it accelerates for 125 m?
D= 125 m, A= .8 m/s^2 , Vi=7 m/s Vf=????, no T
Use Equation 5 Vf^2 = Vi^2 + 2*A*D
Vf^2 = 7^2 + 2*.8*125
Vf^2 = 49+ 126.6= 175.6
Vf = +13.25 m/s

c) What is its velocity after it accelerates for 67 m?

D= 67 m, A= .8 m/s^2 , Vi=7m/s Vf=????, no T

Use Equation 5 $Vf^2 = Vi^2 + 2*A*D$

$Vf^2 = 7^2 + 2*.8*67$

$Vf^2 = 49 + 107.2 = 156.2$

$Vf = +12.498$ m/s

3. A gull soaring in a straight line with an initial velocity of -32 m/s accelerates at a rate of +3.0 m/s^2 for 9 seconds. What is the gull's velocity at the end of the acceleration?

T= 9s , A= 3 m/s^2 , Vi=-32 m/s Vf=????, no D

Use Equation 3: Vf= Vi + AT $Vf = -32 + (3)(9) = -5$ m/s=Vf

4. An aircraft has a liftoff speed of 120 km/hr.

a) What minimum constant acceleration does this require if the aircraft is to be airborne after a take off run of 240 m?

D= 240 m, Vi=0 Vf=120 km/hr=120,000m/3600s=33.3333 m/s, A= ??? m/s^2 , T=???

Use Equation 5 $Vf^2 = Vi^2 + 2*A*D$

$33.33^2 = 0^2 + 2*240*A$

$1111.11 = 0 + 480*A$

$A = +2.31$ m/s^2

b) How long does it take the aircraft to become airborne?

Use Equation 1 $D= (Vi+Vf)/T$

$240 = (0 + 33.333)/T$

$T= 33.33/240 = 0.139$ sec

5. A car accelerates in a straight line from rest at the rate of 2.3 m/s^2 .

What is its final velocity after 55 m?

T= ??s , A= 2.3 m/s^2 , Vi=0 m/s Vf=????, D=55m

Use Equation 5 $Vf^2 = Vi^2 + 2*A*D$

$Vf^2 = 0^2 + 2*2.3*55$

$Vf = \text{sqrt}(253)$

$Vf = +15.9$ m/s

What is its time?

Equation 4: $D = Vi\,T + 1/1\,A\,T^2$

$55 = (0)*(T) + ½*(2.3)*(T)^2$

$55 = 1.15\ T^2$

$55/1.15 = T^2$

$47.83 = T^2$

$T=6.9\ sec$