ACCELERATION SUPPLEMENT WS | KEY

1)

$p(0)=0$
$v(0)=0$

$a(t)=a$ (0)
$v(t)=at+c$ (0)
$p(t)=\frac{1}{2}at^2+c$ (0)

$p(10)=500$

$500=\frac{1}{2}a(10)^2$
$a=10$ ft/sec^2

2)

$v(0)=60$
$p(0)=0$

$v(9)=0$

$a(t)=a$
$v(t)=at+c$
$v(t)=at+60$

$0=a(9)+60$
$-60/9=a$

3)

$v(t)=0$

$v(0)=1600$

$a=-32$
$v=-32t+1600$
$0=-32t+1600$
$t=50$

$p=-16t^2+1600t+0$
$p(50)=40{,}000$ ft

4) $a(t)=-32$
$v(t)=-32t+c$ (0)
$p(t)=-16t^2+c$ (1000)

a) $v(3)=-96$ ft/sec

b) $p(t)=0$ @ $t=7.9$ seconds

c) $v(7.9)=-252.8$ ft/sec

a) $p(t) = -16t^2 - 16t + 96$

b) 2 seconds

c) $v(2) = -32(2) - 16$

$= -80$ ft/sec

5.) $a(t) = -32$

$v(t) = -32t + C$ ← -16

$v(t) = -32t - 16$

$p(t) = -16t^2 - 16t + 96$

6) $a = -5.3$

$v = -5.3t + 60$

$p = -2.65t^2 + 60t + 0$

$0 = -5.3t + 60$

$t = 11.32$

$p(11.32) = 339.62$ ft ON MOON

$p(1.875) = 56.25$ ft ON EARTH

7.) $a(t) = -1.6$

$v(t) = -1.6t + C$ ← 0

$p(t) = -.8t^2 + C$ ← 720

$p(30) = 0$

$0 = -.8(30)^2 + C$

$720 = C$

$p(t) = -.8t^2 + 720$

$v(30) = -48$ m/sec

$p(10) = 640$ ft

8) $a = 20$

$v = 20t + C$ ← 0

$p = 10t^2 + C$ ← 0

$v(60) = 1200$ ft/sec

$p(15) = 2250$ ft

9) $a = -9.8$

$v = -9.8t + C$ ← 0

$p = -4.9t^2 + C$ ← 10

$t = 1.429$

$v(1.429) = -14.004$ m/sec

$p(1.75) = 5$ ft under water

10) $a = -3.72$

$v = -3.72t + 93$

$p = -1.86t^2 + 93t$

$p(25) = 1162.5$ m

11.)

$v(0)=0$
$p(0)=0$

$v(t)=293$
$p(t)=570$

$a(t)=a$
$v(t)=at+c$
$p(t)=\frac{1}{2}at^2+ct$

System of EQ's

$293=at$
$\frac{293}{t}=a$

$570=\frac{1}{2}\left(\frac{293}{t}\right)t^2$

$570=146.5t$

$3.891=t$

$\frac{293}{3.891\ldots}=a$

$a=75.306\ ft/sec^2$

$100=75.306t$

$1.328=t$ seconds

$p(1.328)=\frac{1}{2}(75.306)(1.328)^2$

$=66.657\ ft$

12)

$p(t)=300$
$v(t)=0$

$p(0)=0$
$v(t)=c$

$a(t)=-32$
$v(t)=-32t+c$
$p(t)=-16t^2+ct+0$

System:

$0=-32t+c$ $\quad c=32t$

$300=-16t^2+ct$

$300=-16t^2+(32t)t$

$300=16t^2$

± 4.33

$c=138.564\ ft/sec$