Practice Packet

① $\bar{s} = 333\ m/s$, $v = 0\ m/s$

② $a = 4\ m/s^2$
$t = 4\ sec$
$v_i = 0$
$v_f =$

$v_f = \cancel{v_i} + at$
$v_f = 4(4)$
$v_f = 16\ m/s$

③ $v_i = 25\ m/s$
$a = -4\ m/s^2$
$t = 5\ sec$
$v_f = ?$

$v_f = v_i + at$
$v_f = 25 + (-4)(5)$
$v_f = 5\ m/s$

④ $v_i = 1.75\ m/s$
$a = -0.2\ m/s^2$
$v_f = 0$
$\Delta x = ?$

$v_f^2 = v_i^2 + 2a\Delta x$
$0 = (1.75)^2 + 2(0.2)\Delta x$
$0 = 3.06 + -0.4\Delta x$
$-3.06 \quad -3.06$
$-3.06 = -0.4\Delta x$
$\Delta x = 7.65\ m$

(5) $a = 16.4\ m/s^2$
$\Delta x = 50m$
$V_i = 0$
$V_f = ?$

$V_f^2 = V_i^2 + 2a\Delta x$
$V_f^2 = 2(16.4)(50)$
$\sqrt{V_f^2} = \sqrt{1640}$
$V_f = 40.5\ m/s$

(6) $a = 3\ m/s^2$
$V_i = 0$
$t = 15\ sec$
$V_f = ?$

$V_f = V_i + at$
$V_f = 3(15)$
$V_f = 45\ m/s$

(7) $V_i = 32\ m/s$
$V_f = 96\ m/s$
$t = 8\ sec$
$a = ?$

$V_f = V_i + at$
$96 = 32 + 8a$
$-32 \quad -32$
$\frac{64}{8} = \frac{8a}{8}$ $a = 8\ m/s^2$

(8) $V_i = 0$
$a = 49\ m/s^2$
$\Delta x = 325m$
$V_f = ?$

$V_f^2 = V_i^2 + 2a\Delta x$
$V_f^2 = 2(49)(325)$
$\sqrt{V_f^2} = \sqrt{31850}$
$V_f = 178.5\ m/s$

(9) $t = 15\ sec$

$V_i = 145\ m/s$

$V_f = 75\ m/s$

$\Delta x = ?$

$V_f = V_i + at$

$75 = 145 + a(15)$

$-145 \quad -145$

$\frac{-70}{15} = \frac{15a}{15}$

$a = -4.7\ m/s^2$

$\Delta x = V_i t + \frac{1}{2} a t^2$

$\Delta x = 145(15) + \frac{1}{2}(-4.7)(15)^2$

$\Delta x = 2175 + (-528.75)$

$\Delta x = 1646\ m$

(10) $V_i = 0\ m/s$

$V_f = 4\ m/s$

$t = 4\ sec$

$\Delta x = ?$

$V_f = V_i + at$

$4 = a(4)$

$a = 1\ m/s^2$

$\Delta x = V_i t + \frac{1}{2} a t^2$

$\Delta x = \frac{1}{2}(1)(4)^2$

$\Delta x = 8\ m$

Vertical Motion

① $V_1 = 0$
$a = -9.8 m/s^2$
$t = 8 sec$
$V_f = ?$
$\Delta y = ?$

$V_f = V_1 + at$
$V_f = -9.8(8)$
$V_f = 78.4 m/s$

$\Delta x = V_1 t + \frac{1}{2} a t^2$
$\Delta x = \frac{1}{2}(-9.8)(8)^2$
$\Delta y = -125.44 m$

② $V_1 = 0$
$t = 7.23 s$
$a = -9.8 m/s^2$
$\Delta y = ?$

$\Delta y = V_1 t + \frac{1}{2} a t^2$
$\Delta y = \frac{1}{2}(-9.8)(7.23)^2$
$\Delta y = 256 m$

③ ↑ $V_1 = 95 m/s$
$V_f = 0 m/s$
$a = -9.8 m/s^2$
$\Delta y = ?$

$V_f^2 = V_1^2 + 2a\Delta y$
$0^2 = 95^2 + 2(-9.8)\Delta y$
$0 = 9025 - 19.6\Delta y$
$-9025 \quad -9025$
$\frac{-9025}{-19.6} = \frac{-19.6\Delta y}{-19.6}$
$\Delta y = 460.5 m$

(4) $\Delta y = -1.2\,m$

$V_1 = 0$

$a = -1.62\,m/s^2$

$t = ?$

$\Delta y = V_1 t + \frac{1}{2} a t^2$

$-1.2 = \frac{1}{2}(-1.62)t^2$

$\frac{-1.2}{-0.81} = \frac{-0.81t^2}{-0.81}$

$\sqrt{t^2} = \sqrt{1.48}$

$t = 1.22\ sec$

(5) ↓ $V_1 = -2\,m/s$

$\Delta y = -2.5\,m$

$a = -9.8\,m/s^2$

$V_f = ?$

$t = ?$

$V_f^2 = V_1^2 + 2a\Delta y$

$V_f^2 = (-2)^2 + 2(-9.8)(-2.5)$

$V_f^2 = 4 + 49$

$\sqrt{V_f^2} = \sqrt{53}$

$V_f = -7.28\,m/s$

$V_f = V_1 + at$

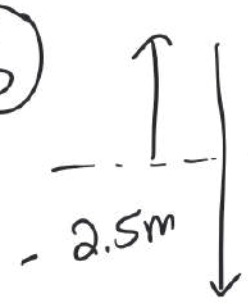
$-7.28 = -2 + (-9.8)t$

$+2 \quad +2$

$\frac{-5.28}{-9.8} = \frac{-9.8t}{-9.8}$

$t = 0.54\ sec$

⑥



$V_i = 2\ m/s$

$a = -9.8\ m/s^2$

$\Delta y = -2.5m$

$V_f = ?$

$t = ?$

$V_f^2 = V_i^2 + 2a\Delta y$

$V_f^2 = 2^2 + 2(-9.8)(-2.5)$

$V_f^2 = 4 + 49$

$\sqrt{V_f^2} = \sqrt{53}$

$V_f = -7.53\ m/s$

$V_f = V_i + at$

$-7.53 = 2 + (-9.8)t$

$-2 \quad\quad -2$

$-9.53 = -9.8t$

$t = 1.0\ sec$

⑦ $V_f = 0$

$a = -9.8\ m/s^2$

$\Delta y = 2.62m$

$V_i = ?$

$t = ?$

$V_f^2 = V_i^2 + 2a\Delta y$

$0^2 = V_i^2 + 2(-9.8)(2.62)$

$0^2 = V_i^2 - 51.35$

$+51.35 \quad\quad +51.35$

$\sqrt{V_f^2} = \sqrt{51.35}$

$V_i = 7.16\ m/s$

$V_f = V_i + at$

$0 = 7.16 + -9.8t$

$-7.16 \quad -7.16$

$\frac{-7.16}{-9.8} = \frac{-9.8t}{-9.8}$

$t = 0.73\ sec$

only half

1.46 sec total

↑

$V_1 = 315\ m/s$

$a = -9.8\ m/s^2$

$V_f = 0$

$t = ?$

$\Delta y = ?$

$V_f = V_1 + at$

$0 = 315 + -9.8t$

$-315 \quad -315$

$\frac{-315}{-9.8} = \frac{-9.8t}{-9.8}$

$t = 32\ sec$ (up only)

$t\ total = 64\ sec$

$\Delta y = V_1 t + \frac{1}{2} a t^2$

$\Delta y = (315)(32) + \frac{1}{2}(-9.8)(32)^2$

$\Delta y = 10080 + -5017$

$\Delta y = 5062\ m$