W-PS Physical Science Week 10

distance = (rate)(time)

displacement = (velocity)(time)

Brayden was in an airplane traveling 380 mi/h for 6.0 hours. How far did he travel?

$x = vt = (380\ mi/h)(6.0\ h)$ 2280 mi

2300 miles

How fast did Rylie go if she ran 84 miles in 3.0 hours?

$\frac{X}{t} = \frac{vt}{t}$

$V = \frac{X}{t} = \frac{84\ miles}{3.0\ hrs}$

28 mi/hr

Acceleration – change in velocity over time.

time (s)	0	2	4	6	8
velocity (m/s)	0	16	40	36	64

instantaneous acceleration $\frac{v_f - v_i}{t_f - t_i}$ = $t\ 0 \rightarrow 2$ $\frac{16-0}{2-0} = \frac{16}{2} = 8\ m/s$

time (s)	0	2	4	6	8
velocity (m/s)	0	16	40	36	64

slowing down

Rylie acceleration from t 2 → 4s

$t = 4$ $t = 2$

$V_f = 40$ $V_i = 16$

$$\left[\frac{V_f - V_i}{t_f - t_i}\right] = \frac{40-16}{4-2} = \frac{24}{2} = \boxed{12\ m/s}$$

Brayden from $t = 4 \rightarrow 6s$

$t = 6s$ $t = 4s$

$V_f = 36$ $V_i = 40$

$$\frac{V_f - V_i}{t_f - t_i} = \frac{36-40}{6-4} = \frac{-4}{2}$$

negative acceleration means slowing down

$= \boxed{-2\ m/s}$

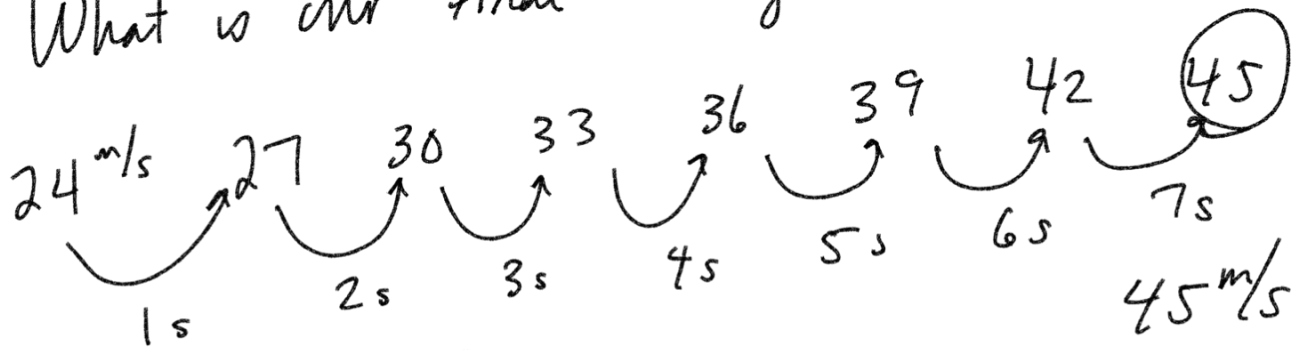
Lucas from $t = 4 \rightarrow 8s$ $\frac{64-40}{8-4} = \frac{24}{4} = \boxed{6\ m/s}$

Acceleration from $t = 2 \rightarrow 8s$ $\frac{64-16}{8-2} = \frac{48}{6} = \boxed{8\ m/s}$

Initial velocity of $24\ m/s$

Acceleration of $3\ m/s^2$

What is our final velocity after $t = 7.0$ secs



$$\boxed{V_f = V_i + at}$$

$24 + (3)(7)$

$24 + 21 = \boxed{45\ m/s}$

L : $V_i = 28\ m/s$ $a = 4\ m/s^2$ $t = 9s$

$V_f = V_i + at$ $V_f = 28\ m/s + (4\ m/s^2)(9s)$

$28\ m/s + 36\ m/s = \boxed{64\ m/s}$

R: $V_i = 36\ m/s$ $a = -2\ m/s^2$ $t = 8s$

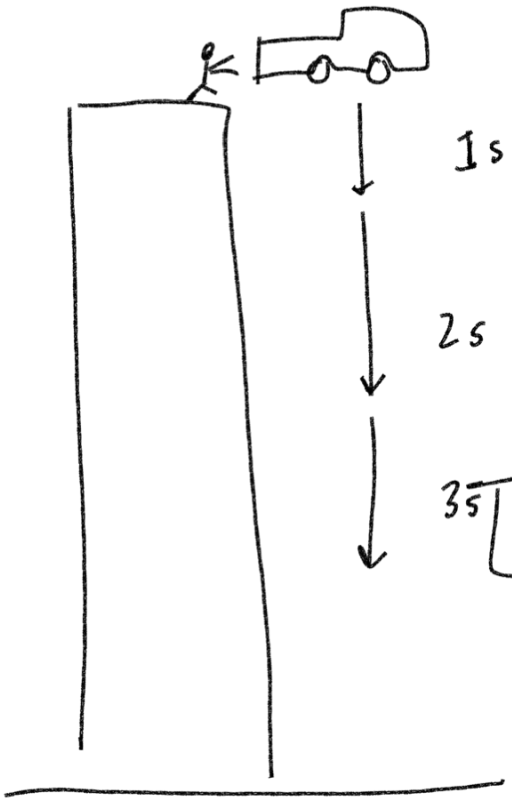
$V_f = V_i + at$ $V_f = 36\ m/s + (-2\ m/s^2)(8s)$

$36\ m/s + (-16\ m/s) = \boxed{20\ m/s}$

B: $\{V_i = -12\ m/s$ $\boxed{a = 8\ m/s^2}$ $\boxed{t = 4s}$

$V_f = V_i + at$ $-12\ m/s + (8\ m/s^2)(4s)$

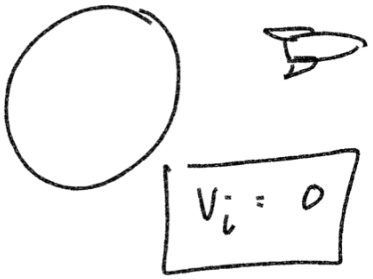
$-12\ m/s + 32\ m/s +$ $\boxed{20\ m/s}$



How fast after 3 seconds?

Acceleration due to gravity $-10\ m/s^2$

$a = 5\ m/s^2$



$54.6 * 10^9$

$54{,}600{,}000{,}000\ m = X_f$

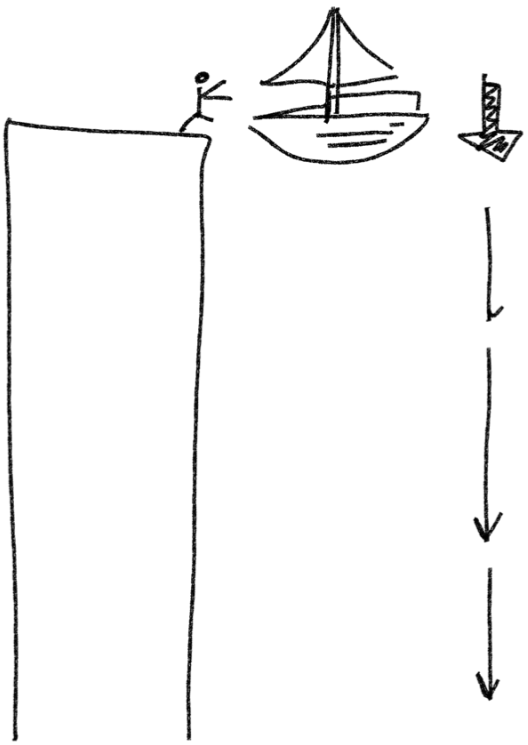
$X_f = \cancel{X_i}^{\,0} + \cancel{V_i t}^{\,0} + \frac{1}{2} a t^2$

$54{,}600{,}000{,}000 = \frac{1}{2}(5\ m/s^2)(t)^2$

$\frac{54{,}600{,}000{,}000}{2.5} = t^2$

$\sqrt{\frac{54{,}600{,}000{,}000}{2.5}} = t$

$147{,}784\ s$



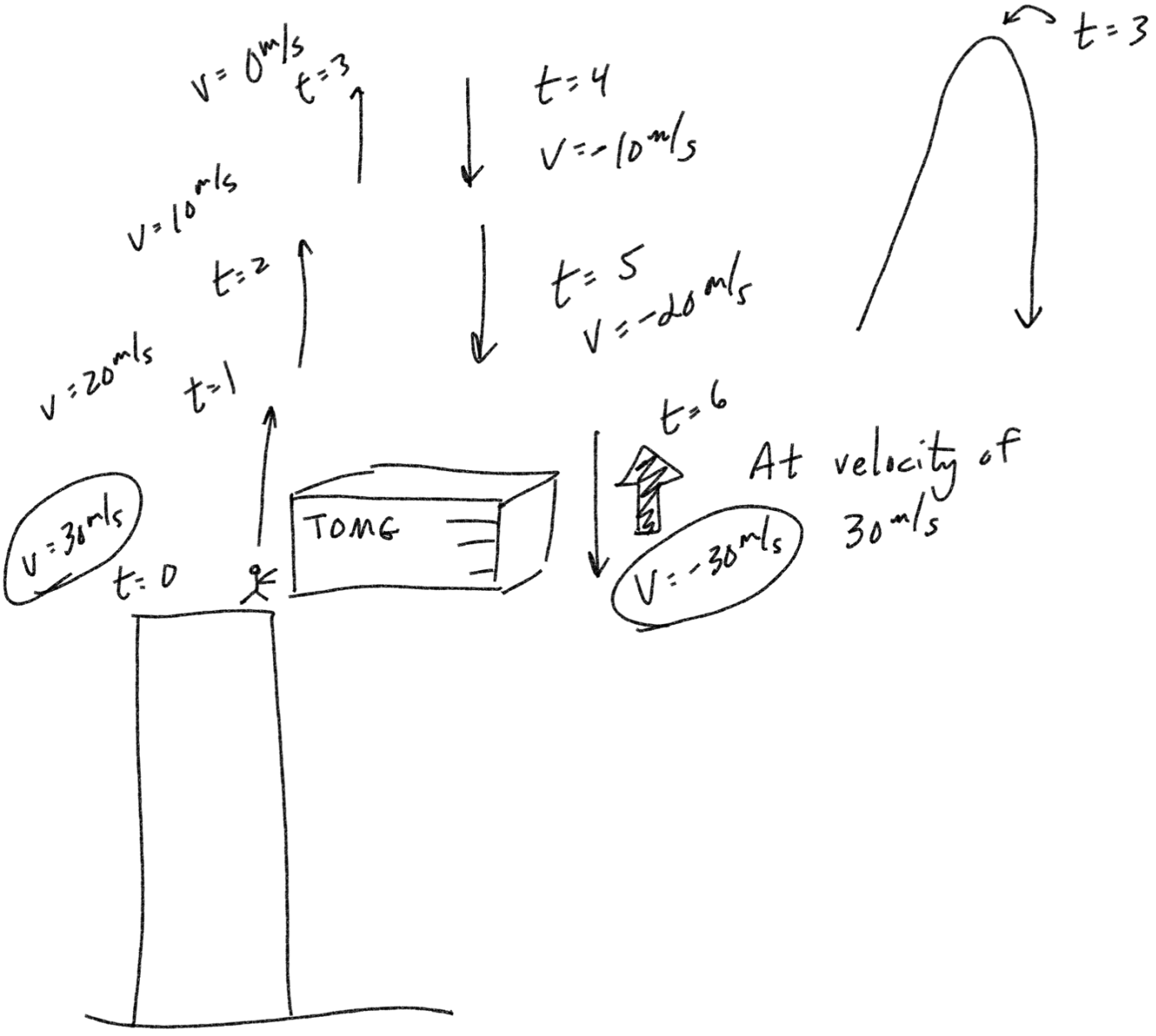
V_i = down at $-25\ m/s$

$t=0 \quad v = -25\ m/s$

$t=1 \quad v = -35\ m/s$

$t=2 \quad v = -45\ m/s$

$t=3 \quad v = -55\ m/s$



$$V_f = V_i + at$$

$$6.0\ m/s + (-3.0\ m/s^2)(12\ s)$$

$$+ 6.0\ m/s + (-36\ m/s)$$

$$\boxed{-30\ m/s}$$

HW

Quiz 8 due tonight

Quiz 9 due Nov 18th

Online Unit 1 Pre-Test (already have it!)

Actual Unit 1 Test due Nov 25th