Match Motion Lab:

- If there is a "right answer" to a question, make sure you let me know.

- Interpret d vs. t & v vs. t graphs — coordinates, slope, area

- Draw one d vs. t & one v vs. t (make them up) and show me what these things mean

10 min., one page

Lofty Heights:

- I will grade your calculations (show work, be neat)
- I will grade your analysis of possible error

Quiz:

- Friday, 9/27
- 1D motion problem
- You'll have to know the "Key"

A runner hopes to complete the 5000-m run in less than 13.0 min. After exactly 11.0 min, there are still 800 m to go. The runner must accelerate at 0.20 m/s² for how many seconds in order to achieve the desired time?
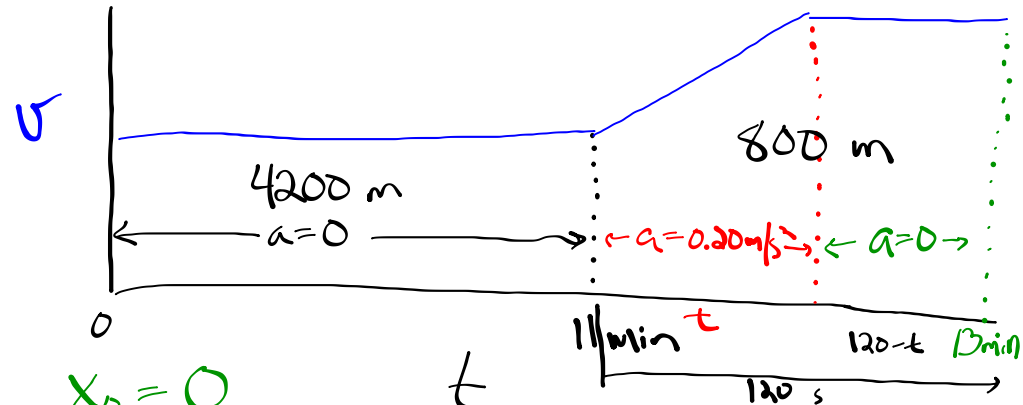
$X_0 = 0$
$X = 4200$
$V_0 = 6.36 \frac{m}{s}$
$V = 6.36 \frac{m}{s}$
$a = 0$
$t = 11 \text{ min}$
$= 660 \text{ s}.$

$V = \frac{d}{t} = \frac{4200 \text{ m}}{660 \text{ s}}$
$=$

$X_0 = 4200 \text{ m}$
$X = 4200 + 6.36t + 0.10t^2$
$V_0 = 6.36 \frac{m}{s}$
$V = 6.36 + 0.2t$
$a = 0.2 \frac{m}{s^2}$
$t = t$

$X_0 = 4200 + 6.36t + 0.10t^2$
$X = 5000 \text{ m}$
$V_0 = 6.36 + 0.2$
$V = 6.36 + 0.2t$
$a = 0$
$t = 120 - t$

$X = X_0 + V_0 t + \frac{1}{2}at^2$
$= 4200 + 6.36t + .10t^2$
$V = V_0 + at$
$= 6.36 \frac{m}{s} + 0.2t$

$$X_0 = 4200 + 6.36t + 0.10t^2$$

$$X = 5000 \text{ m}$$

$$v_0 = 6.36 + 0.2t$$

$$v = 6.36 + 0.2t$$

$$a = 0$$

$$t = 120 - t$$

$$x = x_n + v_0 t + \frac{1}{2}at^2$$

$$5000 = 4200 + 6.36t + 0.10t^2 +$$
$$(6.36 + 0.2t)(120 - t)$$

$$5000 = 4200 + 6.36t + 0.10t^2 +$$
$$763.2 + \cancel{6.36t} + 24t^+ + -0.2t^2$$

$$0 = (-36.8) + 24t + (-0.1)t^2$$

Simplify Numerically:

$$t = 1.543$$

$$t = 238.457$$