

4

$$a = 3.20 \text{ m/s}^2$$



	w/ fuel	w/o fuel
$y_0$	0	→ 1200
$y_f$	1200	0
$v_0$	0	→ 87.65
$v_f$	87.65	
$a$	3.2	-9.8
time	27.39	26.97

$$y_f = y_0 + v_0 t + \frac{1}{2} a t^2$$

$$1200 = 0 + 0 + \frac{1}{2} (3.2) t^2$$

$$\sqrt{\frac{2 \cdot 1200}{3.2}} = t = \underline{\underline{27.39 \text{ s}}}$$

$$v_f = v_0 + a t$$

$$= 0 + 3.2 * 27.39$$

$$= \underline{\underline{87.65 \text{ m/s}}}$$

$$\rightarrow y_f = y_0 + v_0 t + \frac{1}{2} a t^2$$

$$0 = 1200 + 87.65 t - 4.9 t^2$$

$$\rightarrow 0 = 4.9 t^2 - 87.65 t - 1200$$

$$\frac{87.65 \pm \sqrt{87.65^2 + 4(4.9)(1200)}}{9.8}$$

$$\frac{87.65 \pm 176.64}{9.8}$$

$t = 26.97 \text{ s}$  after  
the fuel runs out

or 54.36 s after  
starting