

## I-123

*A 4000 kg rocket's engine produces a thrust of 70,000 N for 15 s. The rocket is fired vertically upward.*

a. What is the speed of the rocket when its engine turns off?

**Free-Body Diagram**



**Mathematical Analysis**

Event 1:

Event 2:

b. How long does it take the rocket to reach its maximum height?

**Free-Body Diagram**



**Mathematical Analysis**

Event 1:

Event 2:

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