Height traveled by model rocket given as;

$$h(t) = -\frac{1}{3}t^3 + 4t^2 + 20t + 2$$

t is measured in seconds.

t corresponding to

To find max. ht., take 1st derivative and set = 0

$$h'(t) = -t^2 + 8t + 20 = 0$$

$$= t^2 - 8t - 20 = 0$$

$$(t-10)(t+2) = 0$$

$t = 10$ $\quad$ $t = -2$ reject neg. value

Max. ht. at $t = 10$ is,

$$h(10) = -\frac{1}{3}(10)^3 + 4(10)^2 + 20(10) + 2$$

$$= -333.3 + 400 + 200 + 2$$

$$= 268.67 \text{ ft.}$$