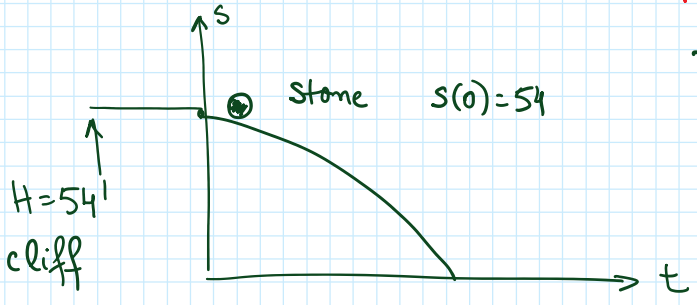
R05 Model Solutions

Monday, September 19, 2022 2:34 PM

3.6.22 Draw a sketch that contains problem information.

$s(t) = -6t^2 + 54$



Stone velocity $v(t) = s'(t) = -12t$

Time at which stone hits ground $s(t_1) = -6t_1^2 + 54 = 0$

Solve equation $t_1^2 = 9 \Rightarrow t_1 = 3$ sec

Evaluate velocity at $t = t_1$

$v(t_1) = -12t_1 = -36$ ft/sec (check, state units of measurement)

3.7.48 $y(x) = (1-e^x)^4 = (f \circ g)(x) = f(g(x))$ Identify function composition

$g(x) = 1 - e^x \quad f(u) = u^4$

Differentiate $y'(x) = f'(g(x))\, g'(x) = 4(1-e^x)^3(-e^x)$

$y'(x) = -4e^x(1-e^x)^3$