Antidifferentiation and Rectilinear Motion

Previously ...

Given $s(t) =$

$v(t) =$

$a(t) =$

Time to max ht	$v(t) = 0 \rightarrow t = \star$
Max ht	$s(\star) =$
Time to gnd	$s(t) = 0 \rightarrow t = \Delta$
Vel at gnd	$v(\Delta) =$

Now... $t = 0$

Given $s =$ ____

Given $v =$ ____

$a(t) =$ ____ → given as a funct.
→ known const.

$a(t) = -32$ ft/miles/in

$a(t) = -9.8$ cm/m/km.

$a(t) =$

$v(t) =$

$s(t) =$

Part moves straight line and $a(t) = 6t + 4$.
If part initially 9 unit right of origin and init. vel is -6, find the pos. funct.

$t = 0$

$s = 9$

$v = -6$

$a(t) = 6t + 4$

$a(t) = 6t + 4$

$v(t) = 3t^2 + 4t + C$

$-6 = C$

$\boxed{v(t) = 3t^2 + 4t - 6}$

$s(t) = t^3 + 2t^2 - 6t + D$

$9 = D$

$\boxed{s(t) = t^3 + 2t^2 - 6t + 9}$

Ball thrown vert up at 48 ft/sec from a 432 ft cliff. Find max ht & vel when hits ground.

$t = 0$

$s = 432$

$v = 48$

$a(t) = -32$

$a(t) = -32$

$v(t) = -32t + C$

$48 = C$

$\boxed{v(t) = -32t + 48}$

$s(t) = -16t^2 + 48t + D$

$432 = D$

$\boxed{s(t) = -16t^2 + 48t + 432}$

Max ht

$v(t) = 0 \rightarrow t = \frac{3}{2}$

$s\left(\frac{3}{2}\right) =$ ✓

Vel at gnd

$s(t) = 0 \rightarrow t = -3.908$ or $t = 6.908$

$v(6.908) = -173.056$

$\therefore$ 173.056 ft/sec down.