Party trick:

```
> eq1 := (m+M)*g*H = 1/2*(m+M)*v0^2;
> eq2 := -M*v0 + m*v0 = M*V + m*v;
> eq3 := 1/2*M*v0^2 + 1/2*m*v0^2 = 1/2*M*V^2 + 1/2*m*v^2;
> eq4 := 1/2*m*v^2 = m*g*h;
> solve({eq1,eq2,eq3,eq4},{v0,v,V,h});
> solve(eq1, v0);
> v0 := %[2];
> solve(eq2,V);
> V := simplify(%);
> solve(eq3,v);
> v := %[2];
> solve(eq4,h);
> h := %;
> limit(h, m = 0);
> solve({eq1,eq2,eq3,eq4}, {v0,V,v,h});
> h := subs( %[2], h);
> h;
> limit(h, m = 0);
```