```
> eq1:=m*v0=(m+M)*V;
```

$$eq1 := m\ v0 = (m + M)\ V$$

```
> eq2:=(m+M)/2*V^2=(m+M)*g*h;
```

$$eq2 := \frac{1}{2}\,(m + M)\ V^2 = (m + M)\ g\ h$$

```
> sol:=solve({eq1,eq2},{V,h});
```

$$sol := \left\{ h = \frac{1}{2}\,\frac{m^2\ v0^2}{g\ (m^2 + 2\ m\ M + M^2)},\ V = \frac{m\ v0}{m + M} \right\}$$

```
> assign(sol);
```

```
> eq1;
```

$$m\ v0 = m\ v0$$

```
> simplify(eq2);
```

$$\frac{1}{2}\,\frac{m^2\ v0^2}{m + M} = \frac{1}{2}\,\frac{m^2\ v0^2}{m + M}$$

```
> limit(h,m=0);
```

$$0$$

```
> limit(V,m=0);
```

$$0$$

```
> limit(h,M=infinity);
```

$$0$$

```
> limit(V,M=infinity);
```

$$0$$

```
> limit(h,v0=0);
```

$$0$$

```
> limit(V,v0=0);
```

$$0$$

```
> h0:=v0^2/g;
```

$$h0 := \frac{v0^2}{g}$$

```
> y:=h/h0;
```

$$y := \frac{1}{2}\,\frac{m^2}{m^2 + 2\,m\,M + M^2}$$

```
> M:=m*x;
```

$$M := m\,x$$

```
> y;
```

$$\frac{1}{2}\,\frac{m^2}{m^2 + 2\,m^2\,x + m^2\,x^2}$$

```
> simplify(");
```

$$\frac{1}{2}\,\frac{1}{1 + 2\,x + x^2}$$

```
> plot(y,x=0..10);
>
```