```
> restart
```

PROBLEMA DEL ARCO Y FLECHA

```
> EcuaDinamica := Masa[6]·diff(s(t), t$2) + Hooke·s(t) = 0
```

$$EcuaDinamica := Masa_6 \left(\frac{d^2}{dt^2} s(t) \right) + Hooke\, s(t) = 0 \quad \textbf{(1)}$$

```
> Hooke := (1143/100)/(3/10); gravedad := 981/100; Masa[6] := (23/1000)/gravedad
```

$$Hooke := \frac{381}{10}$$

$$gravedad := \frac{981}{100}$$

$$Masa_6 := \frac{23}{9810} \quad \textbf{(2)}$$

```
> Condiciones := s(0) = -486/1000, D(s)(0) = 0;
```

$$Condiciones := s(0) = -\frac{243}{500}, D(s)(0) = 0 \quad \textbf{(3)}$$

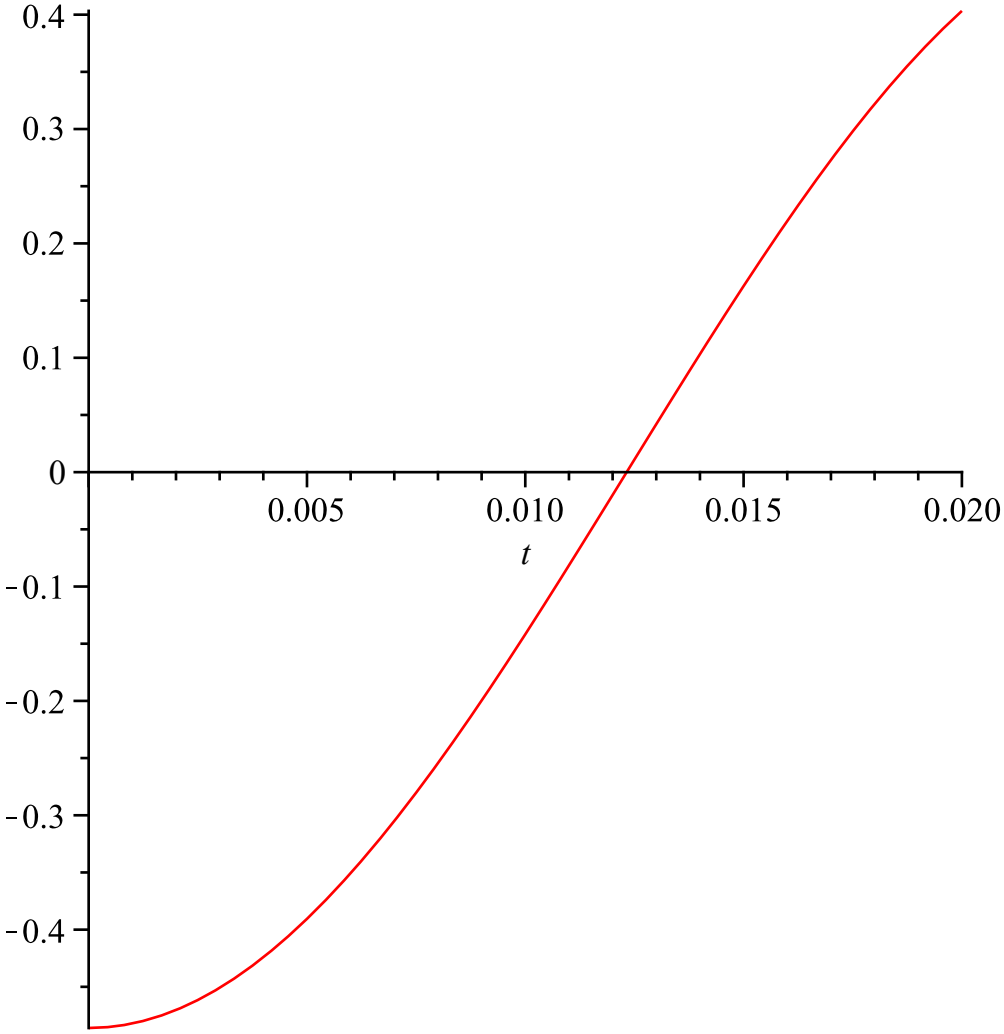
```
> EcuaDinamica;
```

$$\frac{23}{9810} \frac{d^2}{dt^2} s(t) + \frac{381}{10} s(t) = 0 \quad \textbf{(4)}$$

```
> RecorridoArco := dsolve({EcuaDinamica, Condiciones}) : evalf(%, 4)
```

$$s(t) = -0.4860 \cos(127.4\, t) \quad \textbf{(5)}$$

```
> plot(rhs(RecorridoArco), t = 0..0.02)
```



> $TiempoArco := solve(rhs(RecorridoArco) = 0, t) : evalf(\%, 3)$

$$0.0123 \quad \textbf{(6)}$$

> $VelocidadSalida := subs(t = TiempoArco, rhs(diff(RecorridoArco, t))) : evalf(\%, 3);$
$evalf(\%\%, 3) \cdot \left(\frac{3600}{1000}\right)$

$$61.9$$
$$222.8400000 \quad \textbf{(7)}$$

>

TIRO PARABÓLICO

> $EcuaVertical := diff(y(t), t\$2) = -gravedad; EcuaHorizontal := diff(x(t), t) = VelocidadSalida \cdot \cos\left(\frac{Pi}{4}\right)$

$$EcuaVertical := \frac{d^2}{dt^2} y(t) = -\frac{981}{100}$$

$$EcuaHorizontal := \frac{d}{dt} x(t) = \frac{729}{23000} \sqrt{955167} \sqrt{2} \quad \textbf{(8)}$$

> $CondVerticales := y(0) = 2, D(y)(0) = VelocidadSalida \cdot \sin\left(\frac{Pi}{4}\right)$

$$CondVerticales := y(0) = 2,\ D(y)(0) = \frac{729}{23000}\sqrt{955167}\sqrt{2} \quad \textbf{(9)}$$

> $CondHorizontales := x(0) = 5$

$$CondHorizontales := x(0) = 5 \quad \textbf{(10)}$$

> $SolVertical := dsolve(\{EcuaVertical, CondVerticales\}) : evalf(\%, 3);\ SolHorizontal := dsolve(\{EcuaHorizontal, CondHorizontales\}) : evalf(\%, 3)$

$$y(t) = -4.90\,t^2 + 43.7\,t + 2.$$
$$x(t) = 43.7\,t + 5. \quad \textbf{(11)}$$

> $TiempoVuelo := solve(rhs(SolVertical) = 0, t) : evalf(\%, 3)$

$$-0.05,\ 8.97 \quad \textbf{(12)}$$

> $DistanciaMaxima := subs\left(t = TiempoVuelo_2, rhs(SolHorizontal)\right) : evalf(\%, 5)$

$$398.25 \quad \textbf{(13)}$$

> $TiempoAltura := solve(rhs(diff(SolVertical, t)) = 0, t) : evalf(\%, 3)$

$$4.46 \quad \textbf{(14)}$$

> $AlturaMaxima := subs(t = TiempoAltura, rhs(SolVertical)) : evalf(\%, 5)$

$$99.816 \quad \textbf{(15)}$$

>

>

>