

Maple file for the SIR model

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> with(DEtools): with(plots):
```

```
> k:=1/3; b:=1/2; S_0:=7900000; I_0:=10; R_0=0;
```

$$k := \frac{1}{3}$$

$$b := \frac{1}{2}$$

$$S_0 := 7900000$$

$$I_0 := 10$$

$$R_0 = 0$$

(1)

```
> DEs:={diff(s(t),t)=-b*s(t)*i(t), diff(i(t),t)=b*s(t)*i(t)-k*i(t),  
diff(r(t),t)=k*i(t)};
```

$$DEs := \left\{ \frac{d}{dt} i(t) = \frac{1}{2} s(t) i(t) - \frac{1}{3} i(t), \frac{d}{dt} r(t) = \frac{1}{3} i(t), \frac{d}{dt} s(t) = -\frac{1}{2} s(t) i(t) \right\} \quad (2)$$

```
> A:=DEplot(DEs,{s(t),i(t),r(t)},t=0..140,[[s(0)=1,i(0)=I_0/S_0,r  
(0)=0]],scene=[t,s(t)],linecolor=red);
```

A:= PLOT(...)

(3)

```
> B:=DEplot(DEs,{s(t),i(t),r(t)},t=0..140,[[s(0)=1,i(0)=I_0/S_0,r  
(0)=0]],scene=[t,i(t)],linecolor=blue);
```

B:= PLOT(...)

(4)

```
> C:=DEplot(DEs,{s(t),i(t),r(t)},t=0..140,[[s(0)=1,i(0)=I_0/S_0,r  
(0)=0]],scene=[t,r(t)],linecolor=green);
```

C:= PLOT(...)

(5)

```
> display({A,B,C});
```

