(*Battle Model*)

In[ ]:=
```
Clear[a1, a2, R, B, t]
```

In[ ]:=
```
a1 = 0.0544
```

Out[ ]=
```
0.0544
```

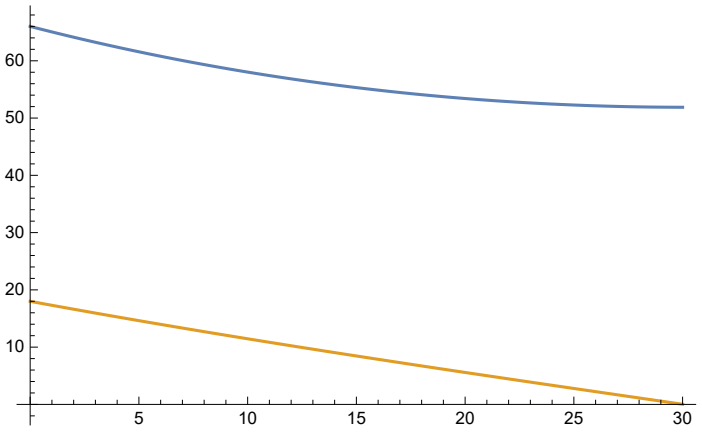
In[ ]:=
```
a2 = 0.0106
de1 = R'[t] == -a1 * B[t]
de2 = B'[t] == -a2 * R[t]
sol = NDSolve[{de1, de2, R[0] == 66, B[0] == 18}, {R[t], B[t]}, {t, 0, 20}]
Plot[Evaluate[{R[t], B[t]} /. sol], {t, 0, 30}]
```

Out[ ]=
```
0.0106
```

Out[ ]=
$$R'[t] == -0.0544\, B[t]$$

Out[ ]=
$$\{\{R[t] \to \text{InterpolatingFunction}[\ \text{Domain: } \{\{0.,\ 20.\}\}\ \text{Output: scalar}\ ][t],$$
$$B[t] \to \text{InterpolatingFunction}[\ \text{Domain: } \{\{0.,\ 20.\}\}\ \text{Output: scalar}\ ][t]\}\}$$

Out[ ]=



jungle warfare

In[ ]:=
```
Clear[a1, a2, R, B, t]
```

In[ ]:=
```
a1 = 0.01
```

Out[ ]=
```
0.01
```

```
In[•]:= a2 = 0.01
        de1 = R'[t] == -a1 * B[t] * R[t]
        de2 = B'[t] == -a2 * R[t]
        sol1 = NDSolve[{de1, de2, R[0] == 66, B[0] == 18}, {R[t], B[t]}, {t, 0, 20}]
        Plot[Evaluate[{R[t], B[t]} /. sol1], {t, 0, 30}, PlotRange → All]
```

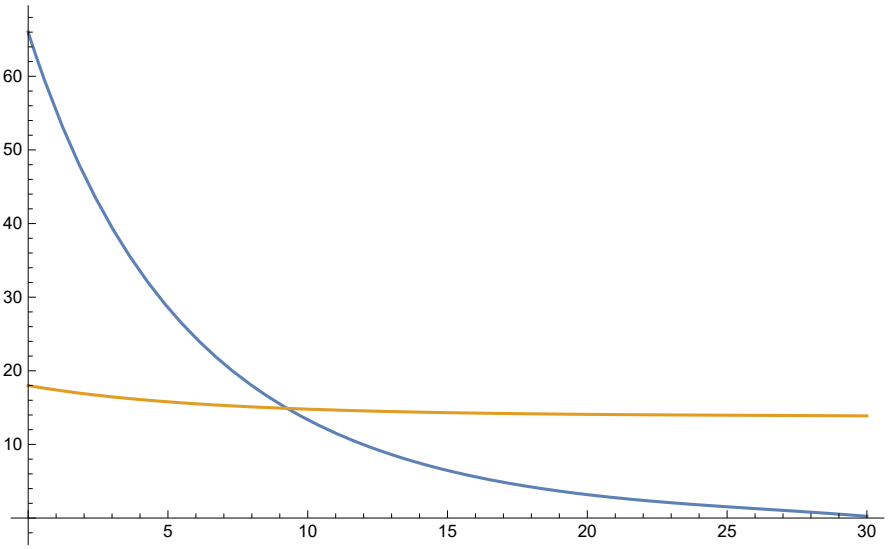
```
Out[•]= 0.01
```

```
Out[•]= R'[t] == -0.01 B[t] R[t]
```

```
Out[•]= B'[t] == -0.01 R[t]
```

```
Out[•]= {{R[t] → InterpolatingFunction[ ⊞ Domain: {{0., 20.}}
                                        Output: scalar ][t],
          B[t] → InterpolatingFunction[ ⊞ Domain: {{0., 20.}}
                                        Output: scalar ][t]}}
```

Out[•]=



Battle With long range weapon

```
In[•]:= Clear[a1, a2, R, B, t, de1, de2, sol1]
```

```
In[•]:= a1 = 0.01
```

```
Out[•]= 0.01
```

```
In[•]:= a2 = 0.01
```

```
Out[•]= 0.01
```

In[•]:=
```
de1 = R'[t] == -a1 * B[t] * R[t]
de2 = B'[t] == -a2 * R[t] * B[t]
sol1 = NDSolve[{de1, de2, R[0] == 66, B[0] == 18}, {R[t], B[t]}, {t, 0, 20}]
Plot[Evaluate[{R[t], B[t]} /. sol1], {t, 0, 30}, PlotRange → All]
```

Out[•]= $R'[t] == -0.01\, B[t]\, R[t]$

Out[•]= $B'[t] == -0.01\, B[t]\, R[t]$

Out[•]= $\{\{R[t] \to \text{InterpolatingFunction}[\langle\text{Domain: } \{\{0., 20.\}\}\ \text{Output: scalar}\rangle][t],$

$B[t] \to \text{InterpolatingFunction}[\langle\text{Domain: } \{\{0., 20.\}\}\ \text{Output: scalar}\rangle][t]\}\}$

Out[•]=