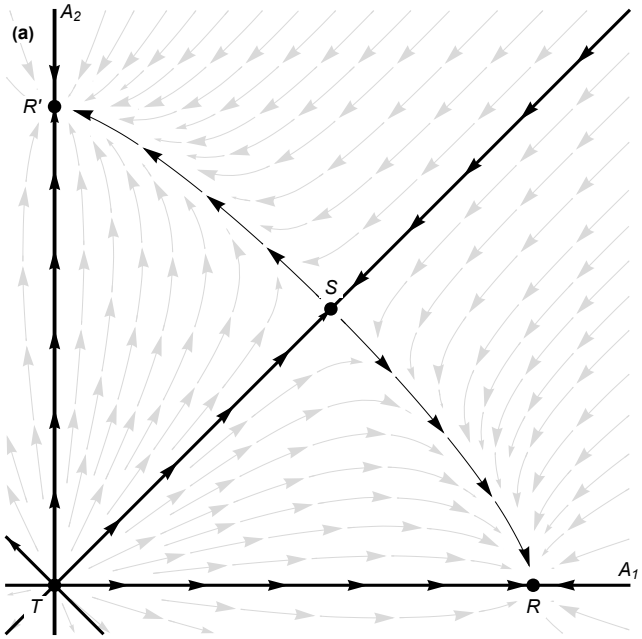
```
In[ ]:= (* set-up *)
vec1[A1_, A2_] := -(M0 * A1 + K0 * A1^3 + K1 * A1 * A2^2)
vec2[A1_, A2_] := -(M0 * A2 + K0 * A2^3 + K1 * A2 * A1^2)

In[ ]:= (* plot for M0 < 0, K0 > 0, K0 + K1 > 0 and K1 - K0 > 0 *)
M0 = -1;
K0 = 1;
K1 = 2;
rolls = {Sqrt[-M0 / K0], 0};
          |Quadratwurzel
rollsY = {0, Sqrt[-M0 / K0]};
              |Quadratwurzel
square = {Sqrt[-M0 / (K0 + K1)], Sqrt[-M0 / (K0 + K1)]};
           |Quadratwurzel                |Quadratwurzel
lineStyle = {Thick};
              |dick
line1 = Line[{{0, -0.1}, {0, 1.2}}];
        |Linie
fig = Plot[{x, 0}, {x, -0.1, 1.2}, PlotStyle → Black, Ticks → None];
      |stelle Funktion graphisch dar          |Darstellungsstil |schwarz |Teilstriche |keine
fig2 = Plot[-x, {x, -0.1, 0.1}, PlotStyle → Black, Ticks → None];
       |stelle Funktion graphisch dar          |Darstellungsstil |schwarz |Teilstriche |keine
vecfield = StreamPlot[{-(M0 * A1 + K0 * A1^3 + K1 * A1 * A2^2),
                       |Strömungsdiagramm
    -(M0 * A2 + K0 * A2^3 + K1 * A2 * A1^2)}, {A1, -0.1, 1.2}, {A2, -0.1, 1.2},
  Epilog → {Black, PointSize[Large], Point[{rolls, {0, 0}, square, rollsY}],
  |Epilog  |schwarz |Punktgröße |groß  |Punkt
    Text[Style[" R ", Italic, Larger], rolls, {0, 2}, Background → White],
    |Text |Stil          |kursiv |größer                    |Hintergrund |weiß
    Text[Style[" T ", Italic, Larger], {0, 0}, {1.5, 2}, Background → White],
    |Text |Stil          |kursiv |größer                    |Hintergrund |weiß
    Text[Style[" S ", Italic, Larger], square, {0, -2}, Background → White],
    |Text |Stil          |kursiv |größer                    |Hintergrund |weiß
    Text[Style[" (a) ", Bold, Larger],
    |Text |Stil          |fett |größer
      {-0.1, 1.2}, {-1, 2}, Background → White],
                            |Hintergrund |weiß
    Text[Style[" R' ", Italic, Larger], rollsY, {1.5, 0}, Background → White],
    |Text |Stil          |kursiv |größer                    |Hintergrund |weiß
    Text[Style["A1", Italic, Larger], {1.2, 0}, {0, -1.5}, Background → White],
    |Text |Stil          |kursiv |größer                    |Hintergrund |weiß
    Text[Style["A2", Italic, Larger], {0, 1.2}, {-1.5, 0}, Background → White],
    |Text |Stil          |kursiv |größer                    |Hintergrund |weiß
    Directive[lineStyle], line1},
    |Anweisung
  StreamStyle → LightGray,
  |Stromlinienstil  |hellgrau
  StreamScale → 0.12,
  |Maßstab der Stromlinien
  StreamPoints → {{{{0.2, 0}, Black},
  |Anfangspunkte der Stromlinien  |schwarz
                  {{1.1, 0}, Black},
                   |schwarz
```

```
        {{0.2, 0.2}, Black},
                     schwarz
        {{1, 1}, Black},
                 schwarz
        {{-0.1, 0.1}, Black},
                      schwarz
        {{0.8, 0.33459}, Black},
                         schwarz
        {{0, 0.1}, Black},
                   schwarz
        {{0, 1.1}, Black},
                   schwarz
        {{0.33459, 0.8}, Black},
                         schwarz
        Automatic}},
        automatisch
    FrameTicks → None, Frame → False];
    Rahmenmarkie···  keine  Rahmen  falsch
figure = Show[vecfield, fig, fig2]
         zeige an
```

Out[ ]=

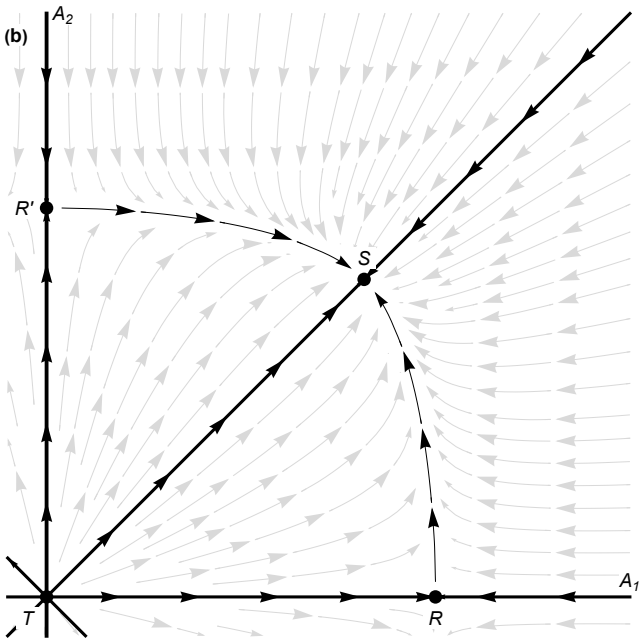



```
In[ ]:= (* plot for M0 < 0, K0 > 0, K0 + K1 < 0 and K1 - K0 > 0 *)
        M0 = -1;
        K0 = 1;
        K1 = 0.5;
        rolls = {Sqrt[-M0 / K0], 0};
                 Quadratwurzel
        square = {Sqrt[-M0 / (K0 + K1)], Sqrt[-M0 / (K0 + K1)]};
                  Quadratwurzel              Quadratwurzel
        rollsY = {0, Sqrt[-M0 / K0]};
                     Quadratwurzel
        lineStyle = {Thick};
                    dick
```

```
line1 = Line[{{0, -0.1}, {0, 1.5}}];
        |Linie

fig = Plot[{x, 0}, {x, -0.1, 1.5}, PlotStyle → Black, Ticks → None];
      |stelle Funktion graphisch dar          |Darstellungsstil |schwarz |Teilstriche |keine

fig2 = Plot[-x, {x, -0.1, 0.1}, PlotStyle → Black, Ticks → None];
       |stelle Funktion graphisch dar          |Darstellungsstil |schwarz |Teilstriche |keine

vecfield = StreamPlot[{-(M0 * A1 + K0 * A1 ^ 3 + K1 * A1 * A2 ^ 2),
           |Strömungsdiagramm

    -(M0 * A2 + K0 * A2 ^ 3 + K1 * A2 * A1 ^ 2)}, {A1, -0.1, 1.5}, {A2, -0.1, 1.5},
   Epilog → {Black, PointSize[Large], Point[{rolls, {0, 0}, square, rollsY}],
   |Epilog      |schwarz |Punktgröße |groß      |Punkt

     Text[Style[" R ", Italic, Larger], rolls, {0, 2}, Background → White],
     |Text |Stil            |kursiv |größer                    |Hintergrund |weiß

     Text[Style[" T ", Italic, Larger], {0, 0}, {1.5, 2}, Background → White],
     |Text |Stil            |kursiv |größer                    |Hintergrund |weiß

     Text[Style[" S ", Italic, Larger], square, {0, -2}, Background → White],
     |Text |Stil            |kursiv |größer                    |Hintergrund |weiß

     Text[Style[" (b) ", Bold, Larger],
     |Text |Stil          |fett |größer

      {-0.1, 1.5}, {-0.5, 2}, Background → White],
                              |Hintergrund |weiß

     Text[Style[" R' ", Italic, Larger], rollsY, {1.5, 0}, Background → White],
     |Text |Stil            |kursiv |größer                    |Hintergrund |weiß

     Text[Style["A₁", Italic, Larger], {1.5, 0}, {0, -1.5}, Background → White],
     |Text |Stil          |kursiv |größer                    |Hintergrund |weiß

     Text[Style["A₂", Italic, Larger], {0, 1.5}, {-1.5, 0}, Background → White],
     |Text |Stil          |kursiv |größer                    |Hintergrund |weiß

     Directive[lineStyle], line1},
     |Anweisung

   StreamStyle → LightGray,
   |Stromlinienstil |hellgrau

   StreamScale → 0.12,
   |Maßstab der Stromlinien

   StreamPoints → {{{{0.2, 0}, Black},
   |Anfangspunkte der Stromlinien |schwarz

                   {{1.1, 0}, Black},
                              |schwarz

                   {{0.2, 0.2}, Black},
                              |schwarz

                   {{1, 1}, Black},
                            |schwarz

                   {{-0.1, 0.1}, Black},
                              |schwarz

                   {{0, 0.2}, Black},
                              |schwarz

                   {{0, 1.1}, Black},
                              |schwarz

                   {rolls + 0.04 * {0, 1}, Black},
                                 |schwarz

                   {rolls + 0.04 * {1, 0}, Black},
                                 |schwarz

                   Automatic}},
                   |automatisch
```

```
    FrameTicks → None, Frame → False];
figure = Show[vecfield, fig, fig2]
```

Out[ ]=

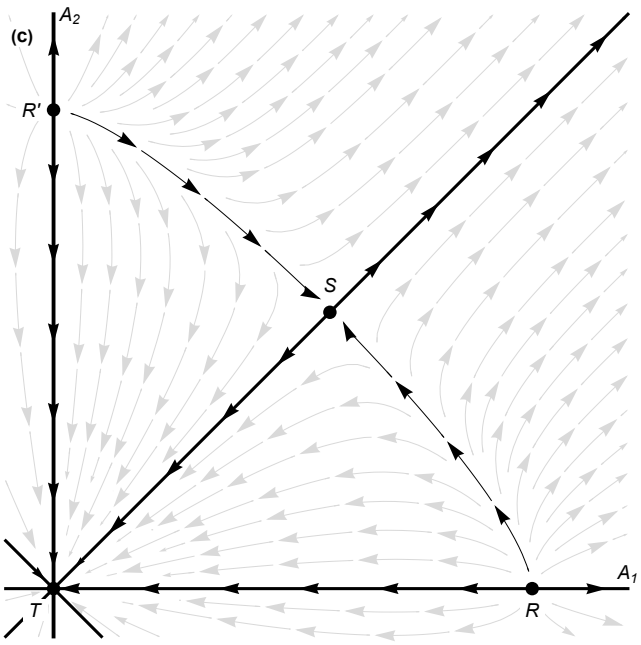


In[ ]:=

```
(* plot for M0 > 0, K0 < 0, K0 + K1 < 0 and K1 - K0 < 0 *)
M0 = 1;
K0 = -1;
K1 = -2;
rolls = {Sqrt[-M0 / K0], 0};
rollsY = {0, Sqrt[-M0 / K0]};
square = {Sqrt[-M0 / (K0 + K1)], Sqrt[-M0 / (K0 + K1)]};
lineStyle = {Thick};
line1 = Line[{{0, -0.1}, {0, 1.2}}];
fig = Plot[{x, 0}, {x, -0.1, 1.2}, PlotStyle → Black, Ticks → None];
fig2 = Plot[-x, {x, -0.1, 0.1}, PlotStyle → Black, Ticks → None];
vecfield = StreamPlot[{-(M0 * A1 + K0 * A1 ^ 3 + K1 * A1 * A2 ^ 2),
    -(M0 * A2 + K0 * A2 ^ 3 + K1 * A2 * A1 ^ 2)}, {A1, -0.1, 1.2}, {A2, -0.1, 1.2},
  Epilog → {Black, PointSize[Large], Point[{rolls, {0, 0}, square, rollsY}],
    Text[Style[" R ", Italic, Larger], rolls, {0, 2}, Background → White],
    Text[Style[" T ", Italic, Larger], {0, 0}, {1.5, 2}, Background → White],
```

```
    Text[Style[" S ", Italic, Larger], square, {0, -2.5}, Background → White],
    Text[Style[" (c) ", Bold, Larger],
      {-0.1, 1.2}, {-1, 2}, Background → White],
    Text[Style[" R' ", Italic, Larger], rollsY, {1.5, 0}, Background → White],
    Text[Style["A₁", Italic, Larger], {1.2, 0}, {0, -1.5}, Background → White],
    Text[Style["A₂", Italic, Larger], {0, 1.2}, {-1.5, 0}, Background → White],
    Directive[lineStyle], line1},
  StreamStyle → LightGray,
  StreamScale → 0.12,
  StreamPoints → {{{{0.2, 0}, Black},
                   {{1.1, 0}, Black},
                   {{0, 0.2}, Black},
                   {{0, 1.1}, Black},
                   {{0.2, 0.2}, Black},
                   {{1, 1}, Black},
                   {{-0.1, 0.1}, Black},
                   {{0.8, 0.33499}, Black},
                   {{0.33499, 0.8}, Black},
                   Automatic}},
  FrameTicks → None, Frame → False];
figure = Show[vecfield, fig, fig2]
```

Out[ ]=



In[ ]:=

```
(* plot for M0 < 0, K0 > 0, K0 + K1 < 0 and K1 - K0 < 0 *)
M0 = 1;
K0 = -1;
K1 = -0.5;
rolls = {Sqrt[-M0 / K0], 0};
        |Quadratwurzel
rollsY = {0, Sqrt[-M0 / K0]};
           |Quadratwurzel
square = {Sqrt[-M0 / (K0 + K1)], Sqrt[-M0 / (K0 + K1)]};
          |Quadratwurzel                |Quadratwurzel
lineStyle = {Thick};
             |dick
line1 = Line[{{0, -0.1}, {0, 1.5}}];
        |Linie
fig = Plot[{x, 0}, {x, -0.1, 1.5}, PlotStyle → Black, Ticks → None];
      |stelle Funktion graphisch dar  |Darstellungsstil |schwarz |Teilstriche |keine
fig2 = Plot[-x, {x, -0.1, 0.1}, PlotStyle → Black, Ticks → None];
       |stelle Funktion graphisch dar  |Darstellungsstil |schwarz |Teilstriche |keine
vecfield = StreamPlot[{-(M0 * A1 + K0 * A1 ^ 3 + K1 * A1 * A2 ^ 2),
                       |Strömungsdiagramm
    -(M0 * A2 + K0 * A2 ^ 3 + K1 * A2 * A1 ^ 2)}, {A1, -0.1, 1.5}, {A2, -0.1, 1.5},
  Epilog → {Black, PointSize[Large], Point[{rolls, {0, 0}, square, rollsY}]},
  |Epilog |schwarz |Punktgröße |groß |Punkt
    Text[Style[" R ", Italic, Larger], rolls, {0, 2}, Background → White],
    |Text |Stil |kursiv |größer |Hintergrund |weiß
    Text[Style[" T ", Italic, Larger], {0, 0}, {1.5, 2}, Background → White],
    |Text |Stil |kursiv |größer |Hintergrund |weiß
    Text[Style[" S ", Italic, Larger], square, {0, -2}, Background → White],
    |Text |Stil |kursiv |größer |Hintergrund |weiß
    Text[Style[" (d) ", Bold, Larger],
    |Text |Stil |fett |größer
```

```
    {-0.1, 1.5}, {-0.5, 2}, Background → White],
                            Hintergrund  weiß
   Text[Style[" R' ", Italic, Larger], rollsY, {1.5, 0}, Background → White],
   Text  Stil          kursiv  größer                    Hintergrund  weiß
   Text[Style["A₁", Italic, Larger], {1.5, 0}, {0, -1.5}, Background → White],
   Text  Stil        kursiv  größer                      Hintergrund  weiß
   Text[Style["A₂", Italic, Larger], {0, 1.5}, {-1.5, 0}, Background → White],
   Text  Stil        kursiv  größer                      Hintergrund  weiß
   Directive[lineStyle], line1},
   Anweisung
  StreamStyle → LightGray,
  Stromlinienstil  hellgrau
  StreamScale → 0.12,
  Maßstab der Stromlinien
  StreamPoints → {{{{0.2, 0}, Black},
  Anfangspunkte der Stromlinien  schwarz
                  {{1.1, 0}, Black},
                             schwarz
                  {{0, 0.2}, Black},
                             schwarz
                  {{0, 1.1}, Black},
                             schwarz
                  {{0.2, 0.2}, Black},
                               schwarz
                  {{1, 1}, Black},
                           schwarz
                  {{-0.1, 0.1}, Black},
                                schwarz
                  {rolls + 0.04 * {0, 1}, Black},
                                          schwarz
                  {rollsY + 0.04 * {1, 0}, Black},
                                           schwarz
                  Automatic}},
                  automatisch
  FrameTicks → None, Frame → False];
  Rahmenmarkie···  keine  Rahmen  falsch
figure = Show[vecfield, fig, fig2]
         zeige an
```

Out[ ]=