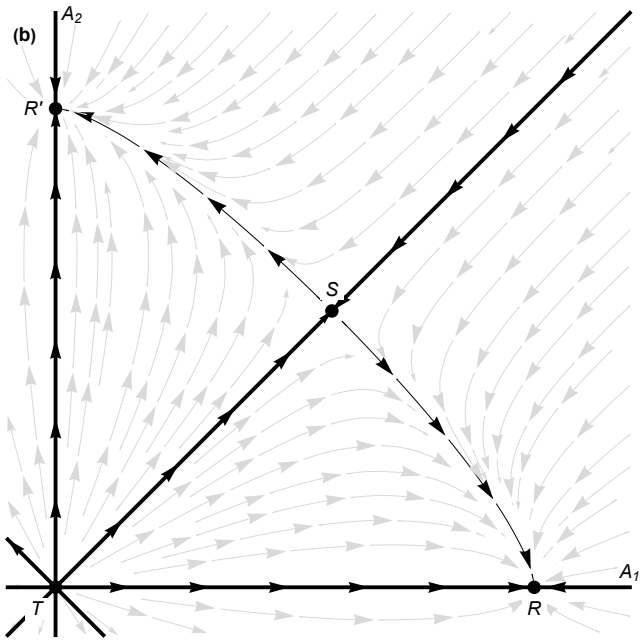
```
In[ ]:= (* set-up *)
vec1[A1_, A2_] := -(M0 * A1 + K0 * A1^3 + K1 * A1 * A2^2)
vec2[A1_, A2_] := -(M0 * A2 + K0 * A2^3 + K1 * A2 * A1^2)

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[" (b) ", 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
  StreamColorFunction → None,
  |Stromlinienfarbfunktion      |keine
  StreamStyle → LightGray,
  |Stromlinienstil      |hellgrau
  StreamScale → 0.12,
  |Maßstab der Stromlinien
  StreamPoints → {{{{0.2, 0}, Black},
  |Anfangspunkte der Stromlinien      |schwarz
```

```
                    {{1.1, 0}, Black},
                    {{0.2, 0.2}, Black},
                    {{1, 1}, Black},
                    {{-0.1, 0.1}, Black},
                    {{0.8, 0.33459}, Black},
                    {{0, 0.1}, Black},
                    {{0, 1.1}, Black},
                    {{0.33459, 0.8}, Black},
                    Automatic}},
  FrameTicks → None, Frame → False];
figure = Show[vecfield, fig, fig2]
```

Out[ ]=

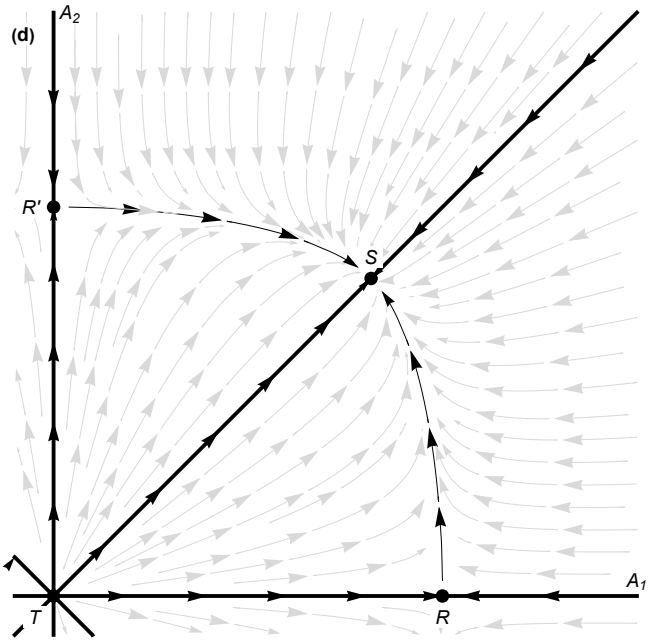



```
In[ ]:= (* plot for M0 < 0, K0 > 0, K0 + K1 < 0 and K1 - K0 > 0 *)
M0 = -1;
K0 = 1;
K1 = 0.5;
rolls = {Sqrt[-M0 / K0], 0};
square = {Sqrt[-M0 / (K0 + K1)], Sqrt[-M0 / (K0 + K1)]};
rollsY = {0, Sqrt[-M0 / K0]};
```

```
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

   StreamColorFunction → None,
   Stromlinienfarbfunktion  keine

   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
```

```
                {rollsY + 0.04 * {1, 0}, Black},
                                          schwarz

                Automatic}},
                automatisch
    FrameTicks → None, Frame → False];
    Rahmenmarkie··· keine  Rahmen  falsch
figure = Show[vecfield, fig, fig2]
         zeige an
```

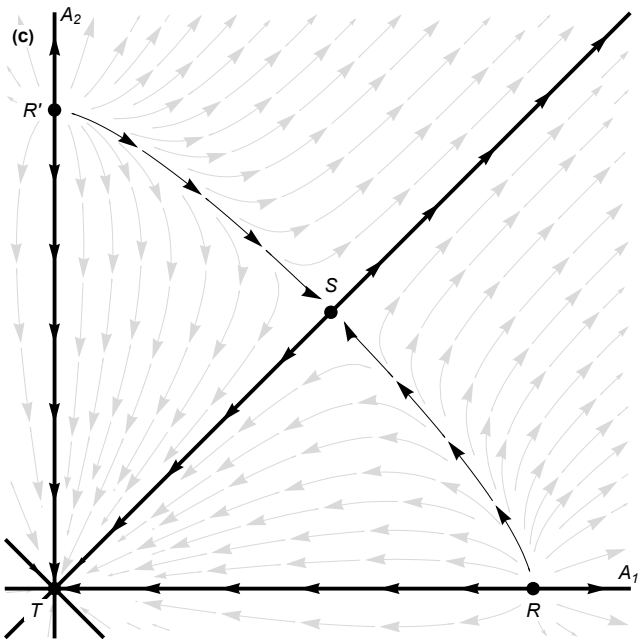
Out[ ]=




```
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[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},
  StreamColorFunction → None,
  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[" (a) ", 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
  StreamColorFunction → None,
  Stromlinienfarbfunktion  keine
  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[ ]=