Contents

HW 6 #3, Walter Coe, 2-17-16

```
clear; clc;
```

Setup

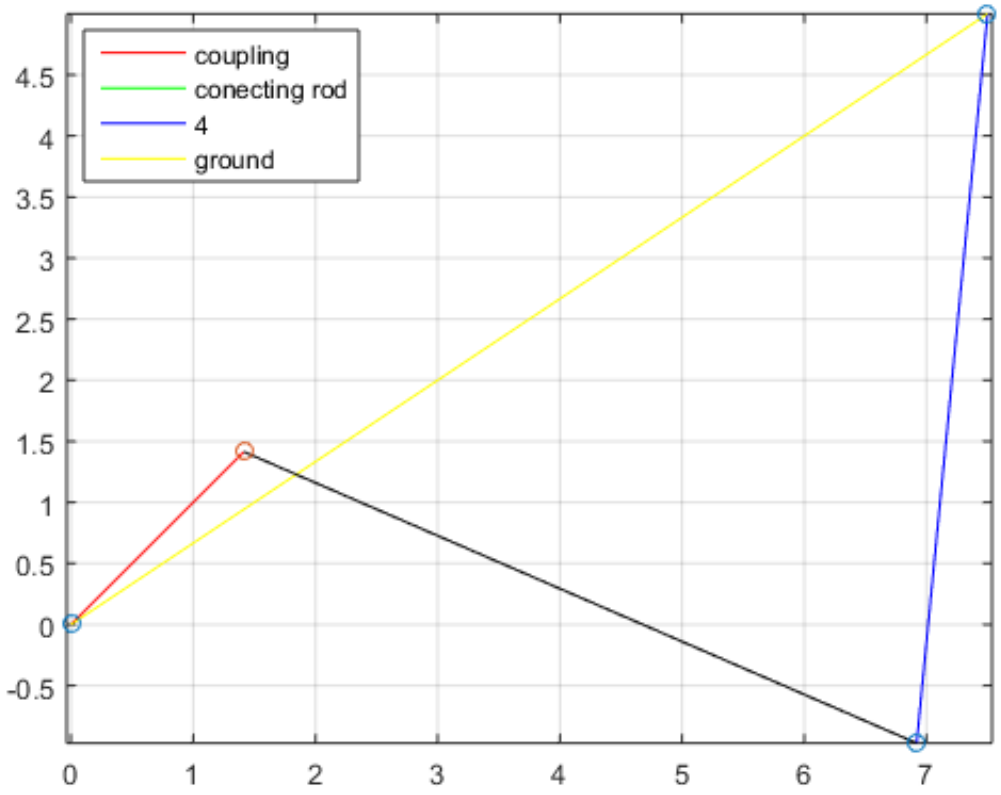
```
r1x = 7.5;
r1y = 5;
r2 = 2;
r3 = 6;
r4 = 6;
r5 = 6;

r1 = sqrt(r1x^2 + r1y^2);
theta1 = rad2deg(atan2(r1y, r1x));

theta2 = 45;
%unkown: theta3, theta4, theta5

omega1 = 0;
omega2 = rad2deg(100*2*pi/60);
%unkown: omega3, omega4, omega5
```

First four bar linkage

```
[angles, angularRates, lengths, linearRates, points, p, vp] = four_bar_func([theta1 theta2 -45 -45
], omega2, [r1 r2 r3 r4], [0 0], [1 0])

theta3Solved = angles(3);
theta4Solved = angles(4);

Va = linearRates(2,:);
Vb = linearRates(3,:);

omega3Solved = angularRates(3);
omega4Solved = angularRates(4);

point3 = points(3,:);
```

```
angles =
```

```
   33.6901   45.0000  -23.4329  -95.5533


angularRates =

         0  600.0000 -347.6594   57.8500


lengths =

    9.0139    2.0000    6.0000    6.0000


linearRates =

         0         0
 -848.5281  848.5281
  345.4712  -33.5895
         0         0


points =

         0         0
    1.4142    1.4142
    6.9194   -0.9718
    7.5000    5.0000


p =

    1.4142    1.4142


vp =

 -848.5281  848.5281
```



Crank Slider Analysis

```
 %[angles, angularRates, lengths, linearRates, points, p] = four_bar_slider([0 (90-theta4Solved) 30
 90], omega4Solved, [9 r4 r5 0], [0 0], 1)

%  theta5Solved = 180-rad2deg(asin((r1x-point3(1))/(r5)));
%  omega5Solved = -(r4*cosd(90-theta4Solved)*omega4Solved/(r5*cosd(theta5Solved)));
%
%  Vc = -r4*omega4Solved*sind(90-theta4Solved)+r5*omega5Solved*sind(theta5Solved);
 Vc = 2*Vb(1); %by symmetry...
```

Report

```
 disp(['Va is: '  num2str(sqrt(Va(1)^2 + Va(2)^2))  ' cm/sec']);
 disp(['Vb is: '  num2str(sqrt(Vb(1)^2 + Vb(2)^2))  ' cm/sec']);
 disp(['Vc is: '  num2str(Vc)  ' cm/sec']);
```

```
Va is: 1200 cm/sec
Vb is: 347.1003 cm/sec
Vc is: 690.9424 cm/sec
```

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