
HW9 Problem 3

```
fprintf('\n');
clearvars -except function_list hw_pub toolsPath
close all
CelestialConstants; % import useful constants

rp = Jupiter.R*2;

% Transfer properties
a_xfer = (Earth.a + Jupiter.a)/2;
v_xfer_f = sqrt(2*Sun.mu/Jupiter.a - Sun.mu/a_xfer);

v_jup = sqrt(Sun.mu/Jupiter.a);
v_inf_jup = abs(v_jup-v_xfer_f);

v_assist_jup_max = abs(v_inf_jup + v_jup);

v_esc_jup = sqrt(2*Sun.mu/Jupiter.a);

spec_energy = v_assist_jup_max^2/2-Sun.mu/Jupiter.a; %J/kg

fprintf('Max velocity from gravity assist: %.3f km/s\n', v_assist_jup_max)
fprintf('Heliocentric escape velocity at Jupiter: %.3f km/s\n', v_esc_jup)
fprintf('The spacecraft can escape the solar system in this mission plan.\n')
fprintf('Max specific energy: %.3f J/kg\n', spec_energy)
```

```
Max velocity from gravity assist: 18.701 km/s
Heliocentric escape velocity at Jupiter: 18.467 km/s
The spacecraft can escape the solar system in this mission plan.
Max specific energy: 4.354 J/kg
```

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