

Individual Exercise - Hohmann Transfer Worksheet

Lynn Robert Carter, PhD

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Activity Kind

Individual Exercise

Purpose

The purpose of this exercise is to build a growing understanding about units and how to work with them.

Pre-requisite

Students are expected to have done the following:

1. Performed the Small Group Activity – Introduction to Units and the Hohmann Transfer Orbit
2. Performed the Individual Research – Units of Measure

Tasking

Each individual must expand the Small Group's answer (from the document , working from the original equation as shown in the example for step 5, below. Notice that each line after the substitution of values for the variables, performs just one computation operation, as you would do when using a calculator. As you compute each new value and replace the operands and the operator with the result, be sure to show the units for the result, if there is one. (For example, below notice that "149600000 km + 227920000 km" was computed to be "377520000" and the units for the result are "km". Also notice in the next step, that value with its unit is divided by 2 and the resulting value has been divided by 2, but the unit is still just "km".

5. Compute the Semi-major Axis of the Transfer Orbit:

$$a_{\text{(Hohman transfer)}} = (R1_{\text{(Earth)}} \text{ km} + R2_{\text{(Mars)}} \text{ km}) / 2$$

$$a_{\text{(Hohman transfer)}} = (149597870 \text{ km} + 227920000 \text{ km}) / 2$$

$$a_{\text{(Hohman transfer)}} = (377517870 \text{ km}) / 2$$

$$a_{\text{(Hohman transfer)}} = 188760000 \text{ km}$$

For each equation in "The Hohmann Transfer Orbit Equations with Units" document, Expand each answer so the above pattern is followed: 1) replace all know variables with values; 2) use the rules of arithmetic to identify the first operator to be performed; 3) perform that operation producing a new value and a unit; 4) replace the values and operator with the result and the proper unit and write out that line; 5) keep doing this until there are no longer any operators in the expression.

When you have finished, save the updated document and submit is as evidence in your ENB.

Deliverable

Each student is responsible for placing the questions and answers into their ENB for this activity.

Submission

The students must produce and submit their ENB by the end of the day.