**Gravity Rules the Earth-Mars Trip NAME <Dessa Shapiro>**

**At Start of Trip - on Earth:**

Distance from Sun (Astronomical Units) = <1>  
Period of Earth’s orbit around Sun (days) = <1>  
Gravitational acceleration at surface (g)\* = 9.8 meters/second2

| **Location of Spacecraft** | **Acceleration due to Earth’s gravity (m/s2)**  **- think inverse square law 1/R2** | **Acceleration due to Mars’s gravity (m/s2)**  **- think inverse square law 1/R2** |
| --- | --- | --- |
| On Earth’s surface (Radius = 1) | 9.8 | Practically zero! |
| One Earth Radius *above* Earth (R=2) | 9.8 m/s^2 2.45  2^2 | Practically zero! |
| Two Earth Radii above Earth (R=3) | 9.8 m/s^2 1.08889  3^2 | Practically zero! |
| Three Earth Radii above Earth (R=4) | 9.8 m/s^2 0.6125  4^2 | Practically zero! |
| Four Earth Radii aboveEarth (R=5) | 9.8 m/s^2 0.392  5^2 | Practically zero! |
| (Middle of the Earth-Mars trip) | (small) | (small) |
| Four Mars Radii aboveMars (R=5) | Practically zero! | <0.152> |
| Three Mars Radii aboveMars (R=4) | Practically zero! | <0.2375> |
| Two Mars Radii aboveMars (R=3) | Practically zero! | <0.42222> |
| One Mars Radius aboveMars (R=2) | Practically zero! | <0.95> |
| ON Mars’s surface (R=1) | Practically zero! | 3.8 |

**At End of Trip - on Mars:**

Distance from Sun (Astronomical Units) = <1.5>  
Period of Mars’s orbit around Sun (Earth days) = 1.02749125 Earth days>  
Gravitational acceleration at surface = 3.8 meters/second2