

# Mars Math with MOXIE

## Answer Key

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- 1) One Mars year is the same as two Earth years. If *Perseverance* stays on Mars for four Mars years, how long will it be gone in Earth years?  
**1 Mars Years = 2 Earth Years, so 4 Mars Years = 8 Earth Years**
- 2) *Curiosity* was the Mars Rover before *Perseverance*; they are about the same size. *Perseverance* weighs about 2,260 pounds, and is 278 pounds heavier than *Curiosity*. How much did *Curiosity* weigh?  
**2,260 – 278 = 1982 Pounds**
- 3) MOXIE produces up to 10 grams of oxygen per hour. If MOXIE were capable of running for 6 hours, how much oxygen would it have made?  
**10 x 6 = 60 Grams**
- 4) The Earth's orbit is not perfectly round nor is Mars's. So, the distance between the planets varies. The closest Mars is to Earth is 35.8 million miles. The furthest they are is 249.1 million miles. By how much do the distances vary?  
**249.1 – 35.8 = 213.3 Miles**
- 5) If the diameter of Mars is 4,220 miles, what is its area?  
**4,220 / 2 = 2,110 miles radius |  $\pi(2,110)^2 = 55,918,376$  Square Miles**
- 6) If the gravity on Earth is 2.66 times that of Mars, where will you weigh more?  
**Earth**
- 7) The volume of Mars is around 39 billion mi<sup>3</sup> (cubic miles) and the volume of Earth is about 260 billion mi<sup>3</sup>. About how many Mars planets would it take to fill up Earth?  
**260 billion mi<sup>3</sup> / 39 billion mi<sup>3</sup> = 6.67 Billion Marses**
- 8) On average, Earth is about 57° F. Mars has an average temperature of -81° F. What is the difference in temperature between their two averages?  
**57 – (-81) = 57 + 81 = 138° F**
- 9) MOXIE is about 9.4 x 9.4 x 12.2 inches on each side. If we approximate and say it is 9 x 9 x 12 inches, what is its volume?  
**9 x 9 x 12 = 972 in<sup>3</sup>**
- 10) *Ingenuity* is the Mars helicopter demonstration project. The blades spin about 2,400 rpm (rotations per minute). If the 'copter flies for 39 seconds, how many rotations did the blades make?  
**2,400 rpm / 60 sec/min = 40 rps (rotations per second) x 39 seconds = 1560 rotations**