Name: _____ **Date:** _____

Your Mission to Mars: The Kinematics Flight Path Challenge for 6th Grade

Calculate orbital shifts and rover velocity to ensure your mission lands safely on the Red Planet using advanced motion analysis.

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1. A rover travels 20 meters North to collect a rock sample, then 20 meters South to return to its lander. What is the rover's total displacement?

A. 40 meters North
B. 0 meters
C. 20 meters
D. 40 meters total distance

2. A falcon dives at a constant 40 m/s toward its prey. This measurement is considered ____ because it specifies both speed and a specific path.

A. Acceleration
B. Displacement
C. Velocity
D. Inertia

3. If a satellite is orbiting Earth at a constant speed in a circular path, it is still technically accelerating.

A. True
B. False

4. You observe a graph where the line is perfectly horizontal on a Velocity vs. Time plot. What does this indicate about the object's motion?

A. The object has stopped moving.
B. The object is speeding up at a constant rate.
C. The object is moving at a constant velocity with zero acceleration.
D. The object is returning to its starting position.

5. An Olympic sprinter increases their speed from 0 m/s to 12 m/s over a span of 3 seconds. Their ____ is 4 m/s^2.

A. Average Velocity
B. Total Displacement
C. Instantaneous Speed
D. Acceleration

6. A maglev train travels 300 km West in 2 hours. What is its average velocity?

A. 150 km/h
B. 150 km/h West
C. 600 km/h West

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D. 300 km/h West

7. An object can have a high speed but a velocity of zero if it moves in a complete circle and ends where it started.

A. True
B. False

8. The slope of a 'Position vs. Time' graph represents the ____ of the object.

A. Velocity
B. Acceleration
C. Distance
D. Force

9. A deep-sea probe is lowered at a rate of 5 meters per second. After 10 seconds, it stops. During the stop, its acceleration was:

A. Positive (speeding up)
B. Zero (constant motion)
C. Negative (deceleration)
D. 50 meters

10. Kinematics focuses on the math of 'how' things move, whereas Dynamics focuses on 'why' (forces) they move.

A. True
B. False