Calculating speed, time, distance and acceleration

Name _____

Equations: $\text{Speed} = \frac{\text{Distance}}{\text{Time}}$ $\text{Time} = \frac{\text{Distance}}{\text{Speed}}$

$\text{Distance} = \text{Speed} \times \text{Time}$ $\text{Acceleration} = \frac{\text{final velocity} - \text{initial velocity}}{\text{time}}$

Directions: Use the equation above to answer the following questions. Show your work and include the units.

1. A football field is about 100 m long. If it takes a person 20 seconds to run its length, how fast (what speed) were they running?

2. The pitcher's mound in baseball is 85 m from the plate. It takes 4 seconds for a pitch to reach the plate. How fast is the pitch?

3. If you drive at 100 km/hr for 6 hours, how far will you go?

4. If you run at 12 m/s for 15 minutes, how far will you go?

5. Every summer I drive to Michigan. It is 3900 km to get there. If I average 100 km/hr, how much time will I spend driving?

6. A bullet travels at 850 m/s. How long will it take a bullet to go 1 km?

7. Every winter I fly home to Michigan. It takes 5 hours. What is my average speed?

8. The fastest train in the world moves at 500 km/hr. How far will it go in 3 hours?

9. How long will it take light moving at 300,000 km/s to reach us from the sun? The sun is 15,000,000 km from earth.

10. It is 21,000 kilometers around the earth and the earth rotates in 24 hrs. How fast is it rotating?

11. A car goes from 0 to 100 km/hr in 10 seconds. What is its acceleration?

12. A bus slams on its breaks and goes from 30 km/hr to 15 km/hr in 4 seconds. What is its acceleration?

Part II Graphing

Directions: Using the data in the following table, construct a graph of distance vs. time. Then answer the questions about that graph.

Distance (m)	Time (sec)
10	20
20	40
35	70
65	130
85	170
100	200

13. Does this graph represent constant or changing speed? How do you know?

14. Find the slope of the line and find the average speed.

Directions: Using the data in the following table, construct a graph of speed vs. time. Then answer the questions about that graph.

speed (m/min)	Time (sec)
8	2
16	4
24	6
32	8
32	10
32	12

15. Does this graph represent constant or changing acceleration? How do you know?

16. Calculate the average acceleration rate of the moving object from 0 to 8 seconds by finding the slope of the line segment.

17. Calculate the acceleration rate of the moving object from 8 to 12 seconds by finding the slope of the line segment.