Key.

GREAT NORTH AMERICAN

ECLIPSE

Eclipse Math

Problem 1 - Get ready to crunch some numbers! Eagle Pass, Texas is set to be the lucky first city to witness the Great North American Eclipse of 2024, while Sharp, Maine will be the last before it heads to Canada. But, hold onto your space helmets! We've got a table filled with juicy details about the eclipse path from Texas to Maine, including the time and distance from each spot. Your mission, should you choose to accept it, is to calculate the average speed of the lunar shadow between each pair of points along the path. Let's start with the first one as an example (check the next page for the full table). Record your answers in this column.

Location	Time (CDT)	Distance (miles)	Speed (miles/hr)
Eagle Pass, TX	12:10:14 p.m.	0	~~1662 miles/hr~~ (sorry:)
Gatesville, TX	12:19:18 p.m	251	1662 mi/hr
Texarkana, TX	12:28:34 p.m	506	1656 mi/hr
Doniphan, MO	12:38:51 p.m	785	1632 mi/hr
Carbondale, Il	12:43.01 p.m	900	1667 mi/hr
South Salem, IN	12:53:02 p.m	1107	1240 mi/hr
Buffalo, NY	1:04:56 p.m	1550	2237 mi/hr
Sharp, MA	1:22:19 p.m	2139	2031 mi/hr

NEED HELP? YOU CAN USE THIS ONLINE TIME CALCULATOR TO HELP YOU DETERMINE THE TIME BETWEEN LOCATIONS.
HTTPS://WWW.CALCULATOR.NET/TIME-DURATION-CALCULATOR.HTML

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Example

Speed is found by using the equation S = *d/t*, where *d* is the distance in miles and *t* is the time in hours.

- **The distance from Gatesville, TX to Eagle Pass, TX is 251 miles.**
- **To change the time from seconds to hours you will need to convert the seconds into hours.** To do this, take the total seconds and divide by the number of seconds in an hour. Since there are 60 seconds in a minute and 60 minutes in an hour there are 3600 seconds/hour (60 sec/min x 60 min/hour).

The time for the shadow to reach Gatesville, TX from Eagle Pass is 9 minutes and 4 seconds.

(9 x 60) + 4 = **544 seconds**

↓

(544 sec)/(3600 sec/hour) = **0.151 hours**

↓

S = *d/t*

S = (251 miles)/(0.151 hours) = **1662 mph!**

Let's crunch some numbers! How far does the path of totality stretch from Eagle Pass, TX to Sharp, MA during the epic 2024 Great North American Eclipse? And, what's the average speed of the shadow race from Texas to Maine? 2139 mi

2139 mi / 1.201 hrs = 1781.02 mi/hr

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Problem 2 - Ready, set, research! Find out which of these superhero vehicles will give you the best shot at keeping up with the shadow and witnessing the most epic eclipse of all time!

Vehicle	Top Speed (miles/hour)	
Superman	7,680 mi/hr	✓
Spiderman	30-125 mi/hr	
Hennessey Venom F5	301 mi/hr	
SR71 Blackbird	2200 mi/hr	✓
Bugatti Chiron Super Sport 300+	304 mi/hr	
MIG-25 Fox Bat Jet	2190 mi/hr	
Thrust SCC (driven by Andy Green)	763 mi/hr	
XB-70 Valkyrie	2056 mi/hr	
X-15	4520 mi/hr	
Millennium Falcon	652 mi/hr	

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Get ready to be wowed by a fantastic math trick involving our favorite celestial bodies - the Earth, Moon, and Sun. It's all thanks to a simple, yet mind-bending ratio that makes eclipses possible!

	Diameter (miles)	Distance from Earth (miles)
Sun	864,938	93,000,000
Moon	2,159	238,900

Divide these two numbers!

400.62 : 389.28

Put answer here! Put answer here!

This is the ratio you seek!

(or approximately 1:1)!

It's a cosmic coincidence! The Sun's size dwarfs the Moon's, but it's also much farther away. By some magical math, this distance-to-size ratio lands at a sweet spot where the Sun and Moon look almost equal in size from our viewpoint. That's why we get to witness total solar eclipses, where the Moon can perfectly block the Sun's light show.

https://mynasadata.larc.nasa.gov/phenomenon/solar-eclipse