



Math Moves Me In Travel

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Introduction

One of my favorite things to do is go on vacation. I have currently traveled to 28 states and seen many amazing sites, including my favorite, Yellowstone. As I have traveled, I have realized that math is an important part of travel. From buying tickets for planes and hotels to understanding travel times and time zones, math moves me and people all around the world in travel.





Travel time: Airplane vs. car

Sometimes, we travel by air, and sometimes we travel by car. Sometimes, we do both. This past Christmas, my family and I took a trip to Houston. We flew there on an airplane, and then we drove the same distance back in a car. Wow, it took a lot more time to drive back.

Airplane	Car
(AA) Average Accent = 25min = .416 hours (AD) Average Decent = 12min = .2 hours (D) Aeronautical Distance = 790 miles (S) Average Speed = 500 miles p/hour Formula I created using Distance Traveled: $T = D/S + (AA + AD)$	(S) Average speed = 65 miles p/hour (D) Distance = 981 miles Distance Traveled Formula is $T = D/S$
$T = 790/500 + (.416 + .2)$ $T = 1.58 + (.616)$ $T = 2.196$ hours	$T = 981/65$ $T = 15.092$ hours

Time Zones

Formulas to calculate time:

East Coast to Central Time

Time - 1 Hour

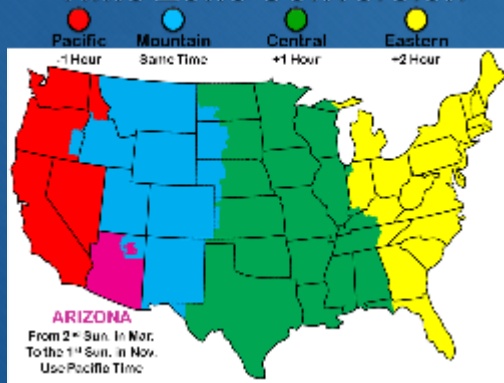
East Coast to Mountain Time

Time - 2 Hour

East Coast to Pacific Time

Time - 3 Hour

Time Zone Conversion



Last summer, we traveled to Yellowstone, which meant that we changed time zones. Our plane departed from Tampa International Airport at 10:47 a.m. We traveled to Yellowstone, WY, which is 2 time zones away, and the flight took 5 hours and 22 minutes.



Departure Time: 10:47am Eastern Standard Time

Travel Time: 5 hours and 22 minutes

Arrival Time:

$10:47 + 5:22 = 4:09\text{pm}$ Eastern Standard Time

What time would it be in Yellowstone, WY?

Time Zone Conversion: Mountain Time = -2 hours

$4:09 - 2:00 = 2:09\text{pm}$ Mountain Time



Hotel stay: Hotel A or Hotel B?

We try to stay at the same brand of hotel, but we also want to get the best deal.
When my dad and I went to New Orleans, we had to choose between Hotel A and Hotel B.

Hotel A— a one night stay is \$179, plus breakfast \$14.95 (20% discount on breakfast)

Hotel B—a one night stay is \$229 (breakfast included)

Hotel A

(H) Price of Hotel = \$179.00
(B) Price of Breakfast = \$14.95
Formula I created:
 $TC = H + ((2B) \times .8)$

$TC = \$179.00 + (2(\$14.95)) \times .8$
 $TC = \$179.00 + (\$29.90 \times .8)$
 $TC = \$179.00 + \23.92
 $TC = \$202.92$

Hotel B

(H) Price of Hotel = \$229.00
(B) Price of Breakfast = \$0.00

$TC = \$229.00 + \0.00
 $TC = \$229.00$

Costs to Travel by Car

Sometimes we travel for pleasure and sometimes for soccer tournaments. My dad and I traveled to West Palm Beach, Florida, in early December 2014 for a soccer tournament that I played in. We drove from Dunedin to West Palm Beach and back. We took the Florida Turnpike, which requires drivers to pay a toll. This is how much it cost us to travel by car.

Facts about our drive:

Distance from Dunedin to West Palm Beach is 232 miles.

My dad's car averages 22 miles p/gallon.

A gallon of gas cost \$2.26 when we took the trip.

61.8 miles of a one way trip is on the Florida Turnpike. The Florida Turnpike has a unit rate of \$0.075 per mile for tolls.



TC = Total Cost

D = Distance

MPG = Miles Per Gallon

CG = Cost of Gas

TR = Turnpike Rate

TM = Turnpike Miles

I created this formula:

$$TC = 2 \times ((D/MPG) \times CG) + (TR \times TM)$$

$$TC = 2 \times ((232/22) \times \$2.26) + (\$0.075 \times 61.8)$$

$$TC = 2 \times (10.55 \times \$2.26) + \$4.64$$

$$TC = 2 \times \$23.83 + \$4.64$$

$$TC = 2 \times \$28.47$$

$$TC = \$56.94$$



Range of Elevations

Location:	Adventure:	Compared to Sea Level
Natural Bridge Caverns, San Antonio, Texas	Spelunking	470 feet above
Homosassa, Florida	Scalloping	-11 feet below
Grand Tetons, Wyoming	Hiking	13,775 feet above

We love to be adventurous. When I recently went to San Antonio, Texas, I went spelunking in some caverns. I was told we went 180 feet below the surface of the Earth at our greatest depth. But, I just recently learned that I wasn't even below sea level because San Antonio is 650 feet above sea level.

So, it made me wonder how extreme my elevations have been with some of my travel adventures.

My greatest range of elevations is between scalloping in Homosassa Springs, Florida, and hiking the Grand Tetons, Wyoming.

$$\text{Range} = 13,775 - (-11) = 13,786 \text{ feet}$$

States Left to Visit



My goal is to visit all 50 states before I turn 18 and go away to college. I have been to 28 states so far. I wanted to try to figure out how many states I will need to visit per year to reach my goal of all 50 states.

As of right now, here is how many states I would need to visit each year.

**18-12 = 6 years before I turn 18
50-28 = 22 states left to visit
22/6 = 3.66 states per year**

This summer, we plan to go out West and visit five states, which will help decrease the number of states we need to visit each year.

(Total US states - (states visited + planned states to visit)) / (goal age – current age) = Avg. states needed to visit p/year

**(50 - (28 + 5))/(18-12) =
50 - 32 / 6 =
18 / 6 = 3 Avg. states needed to visit p/year**

Conversions: Euro to Dollar

I also want to visit Europe. I want to visit Paris. I know that one activity that I want to do is to go up the Eiffel Tower. I need to know the cost and the conversion.



A screenshot of a currency table titled "currency table" and "U.S. Federal Reserve System, 12.07.2013". It lists various currencies and their conversion rates to the US Dollar. The EUR/USD rate is highlighted as 1.3048. A blue arrow points from the text "the conversion." to this specific rate.

Currency	Rate
EUR/USD	1.3048
USD/BRL	2.2677
GBP/USD	1.5108
USD/SEK	6.6760
USD/JPY	99.3900
USD/CAD	1.0353
USD/CNY	6.1373
USD/HKD	7.7581

Prices to go to the top of the Eiffel Tower are 15 Euros for an adult and 13.5 Euros for a child. I want to buy tickets for my best friend and my parents. So, 2 adults and 2 children. How much will it cost in US dollars?

I am going to first figure out the total cost in Euros and then convert the amount to US dollars.

TC = Total Cost
C = Cost per Child Ticket
A = Cost per Adult Ticket

$$TC = (2C) + (2A)$$
$$TC = (2 \times 13.5 \text{ Euros}) + (2 \times 15 \text{ Euros})$$
$$TC = 27 \text{ Euros} + 30 \text{ Euros} = 57 \text{ Euros}$$

I am now going to convert the cost in Euros to US Dollars.

The EUR/USD Conversion Rate is 1.3048
57 Euros x 1.3048 = \$74.38 US Dollars

I have never traveled anywhere where I have had to use Euros, but I really want to go to Paris where they use them all the time.

Math and Travel

I actually never really thought about it before this project, but math has a TON to do with travel. If you're going on an airplane, buying hotel tickets, or doing anything in between, math has a lot to do with how you get there and what you do once you are there.

Adios!

Bon Voyage!

Good bye!

