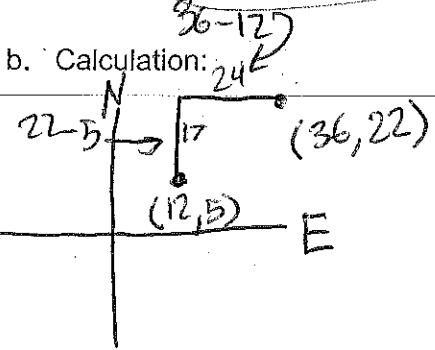


$D = rt$ around PDX

Use the addresses to map out your route. Predict how long it will take **before you do any math**. Then, calculate how long each route will take. Finally, compare your answer to Google Maps.

1. You're at Benson (546 NE 12th Ave) and you want to walk to Grant (2245 NE 36th Ave). You can walk an average speed of 3 mph. How long will it take?

a. Prediction: 45 minutes?



Blocks = $24 + 17 = 41$
 $41 \text{ blocks} \cdot \frac{250 \text{ feet}}{1 \text{ block}} \cdot \frac{1 \text{ mile}}{5280 \text{ feet}} = \frac{10250 \text{ feet}}{5280}$

$d = 1.94 \text{ miles}$

c. Google:

39 minutes.

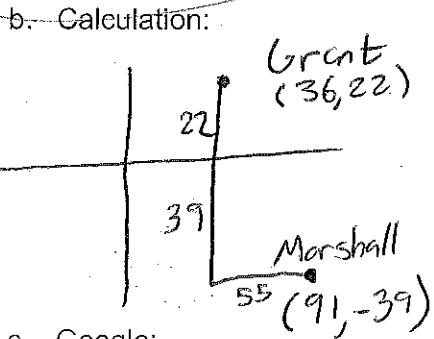
$d = r \cdot t$
 $1.94 = 3 \cdot t$
 $\frac{1.94}{3} = t$

$0.646 \cdot 60 = 38.8 \text{ minutes}$

$0.646 \text{ hours} \rightarrow$

2. You're at Marshall (3905 SE 91st Ave) and you want to bike to Grant (2245 NE 36th Ave). You can bike an average speed of 12 mph. How long will it take?

a. Prediction: 30 minutes?



Blocks: $22 + 55 = 77$ blocks
 $77 \text{ blocks} \cdot \frac{250 \text{ feet}}{1 \text{ block}} \cdot \frac{1 \text{ mile}}{5280 \text{ feet}} = \frac{19125 \text{ feet}}{5280}$

$d = 5.49 \text{ miles}$

$d = r \cdot t \rightarrow t = \frac{d}{r}$

$t = \frac{5.49 \text{ miles}}{12 \text{ mph}} = 0.46 \text{ hours}$

$0.46 \text{ hours} \cdot 60 \text{ min} = 27.45 \text{ minutes}$

c. Google: $91 - 36 = 55$
~~2245~~

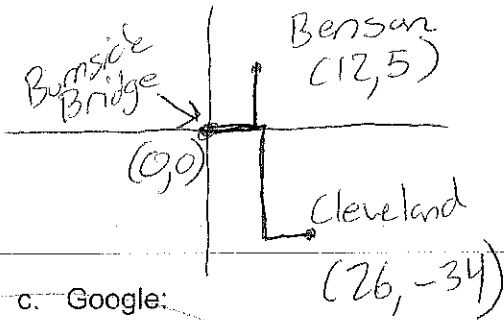
37 minutes or 40 minutes

3. You're at Cleveland (3400 SE 26th Ave) and you want to bike to Benson (546 NE 12th Ave), but first you want to take a selfie at the middle of the Burnside Bridge (which is 1350 feet long). You can bike 150 feet in 10 seconds. How long will it take?

a. Prediction:
 25 minutes?

Blocks: $26 + 34 + 12 + 5 = 77$
 To bridge To Benson

b. Calculation:



~~77 blocks~~ $\frac{250 \text{ feet}}{1 \text{ block}} = 19,250 \text{ feet}$

$19,250 + 675 + 675 = 20,600 \text{ feet}$
 $\frac{1}{2}$ bridge $\frac{1}{2}$ bridge

$r = \frac{150 \text{ feet}}{10 \text{ seconds}} = 15 \text{ fps}$

$t = \frac{20,600 \text{ feet}}{15 \text{ fps}} = 1,373 \text{ seconds}$
 = 22.8 minutes

c. Google:

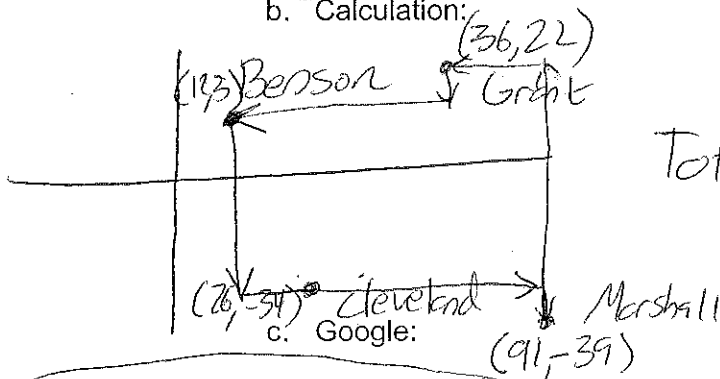
26 minutes

4. Mr. Maurer is training for his marathon by running from school to school (because he's a teacher, and teachers spend ALL their time at school). He starts at Benson, runs to Cleveland, over to Marshall, up to Grant, and finishes back at Benson. If he runs 4 miles in 40 minutes, how long will it take?

a. Prediction:
 4 hours?

Blocks: $14 + 5 + 34 + 65 + 5 = 123$ blocks
 Benson → Cleveland Cleveland to Marshall

b. Calculation:



$39 + 22 + 55 + 24 + 17 = 157$ blocks
 Marshall → Grant Grant → Benson

Total: $123 + 157 = 280$ blocks

$280 \text{ blocks} \cdot \frac{250 \text{ feet}}{1 \text{ block}} \cdot \frac{1 \text{ mile}}{5280 \text{ feet}} = \frac{70,000}{5280} \text{ miles} = d$

$\frac{70,000}{5280} = 13.26 \text{ miles} = d$

$r = \frac{4 \text{ miles}}{40 \text{ minutes}} = \frac{1 \text{ mile}}{10 \text{ minutes}}$

$\frac{d}{r} = t = \frac{13.26}{\frac{1}{10}} = 132.6 \text{ minutes}$

= 2 hours 12.6 minutes

Walk time: 4hr 39min
 Bike time: 1hr 29min
 Our run time is in the middle, so it seems reasonable.