Part 1.

Nico wants to go swimming with friends at the pool! Sadly though Nico's body isn't waterproof so Nico needs to prepare first. The plan is to use waterproof paint to protect Nico's body but Nico isn't sure how much waterproof paint is needed! Nico knows that each fluid ounce of waterproof paint covers three square inches. Your goal will be to help Nico figure out how much waterproof paint is needed using the table below.

Step	Body Part	Surface Area (inches)	Volume of Paint (fluid oz)
0	Feet	6	2
1	Legs	12	
2	Torso		6

Solution:

STEP ONE

Step	Body Part	Surface Area (inches)	Volume of Paint (fluid oz)
0	Feet	6	2
1	Legs	12	_**4**_
2	Torso		6

$$6 : 2$$
$$12 : ?$$

$$6 \times ?? = 12$$
$$6 \times 2 = 12$$
$$\textbf{So...} \quad 2 \times 2 = 4$$

STEP TWO

Step	Body Part	Surface Area (inches)	Volume of Paint (fluid oz)
0	Feet	6	2
1	Legs	12	*4*
2	Torso	*18*	6

$$6 : 2$$
$$12 : 4$$
$$18 : 6$$

$$2 \times \text{??} = 6$$
$$2 \times 3 = 6$$
So… $6 \times 3 = 18$

Part 2.

...Well except for Nico's arms and head! If Nico wants to go into the water all the way, Nico's hands, arms, and head must be protected also! Help Nico out fill out the following table:

Step	Body Part	Surface Area (inches)	Volume of Paint (fluid oz)
0	Hands	6	2
1	Arms	3	
2	Head		3

Solution:

STEP ONE

Step	Body Part	Surface Area (inches)	Volume of Paint (fluid oz)
0	Hands	6	2
1	Arms	3	*__1__*
2	Head		3

$$6 : 2$$
$$3 : ?$$

$$\frac{6}{2} = \frac{3}{?}$$
$$2 \times 3 = 6 \quad \text{(cross-multiply)}$$
So... $6 \div 6 = 1$

STEP TWO

Step	Body Part	Surface Area (inches)	Volume of Paint (fluid oz)
0	Hands	6	2
1	Arms	3	*1*
2	Head	*9*	3

$$6 : 2$$
$$3 : 1$$
$$? : 3$$

$$\frac{6}{2} = \frac{?}{3}$$

$6 \times 3 = 18$ (cross-multiply)

So... $18 \div 2 = 9$

Part 3.

With plenty of waterproof paint, Nico is ready to head to the pool! However, Nico lives in a neighborhood VERY far from the pool. Nico is going to have to ride a bike! Once Nico gets on the road, Nico travels at a constant rate of 10 mph (Nico is a very fast bike rider!). Riding so fast makes Nico tired. Use the below table to help Nico figure out where to stop to rest at different points throughout the ride.

Step	Time (hours)	Distance (miles)
0	1	10
1	2.5	
2		30
3	6	

Solution:

STEP ONE

Step	Time (hours)	Distance (miles)
0	1	10
1	2.5	_**25**_
2		30
3	6	

$$1 \ : \ 10$$
$$2.5 \ : \ ??$$

$$1 \times ?? \ = \ 2.5$$
$$1 \times 2.5 \ = \ 2.5$$
So… $10 \times 2.5 \ = \ 25$

STEP TWO

Step	Time (hours)	Distance (miles)
0	1	10
1	2.5	**_25_**
2	**_3_**	30
3	6	

1 : 10
2.5 : 25
?? : 30

10 × ?? = 30
10 × 3 = 30
So… 1 × 3 = 3

STEP THREE

Step	Time (hours)	Distance (miles)
0	1	10
1	2.5	**_25_**
2	**_3_**	30
3	6	**_60_**

1 : 10
2.5 : 25
3 : 30

1 × ?? = 6
1 × 6 = 6
So… 10 × 6 = 60

Part 4.

Since it is going to take so long to reach the pool, Nico decides to stop and get some snacks. Nico LOVES M&M's.Nico wants to have ALL the M&Ms so if Nancy, Pedro, Chris and Nina are at the pool also, more bags are definitely needed. Nico decides to figure out how many total M&Ms everyone will have depending on how many bags are bought.

Step	Bags of M&Ms	Total M&Ms
0	1	110
1	2	
2	5	
3		770

STEP 1

Step	Bags of M&Ms	Total M&Ms
0	1	110
1	2	***220***
2	5	
3		770

$$1 : 110$$
$$2 : ?$$

$$\frac{1}{110} = \frac{2}{?}$$
$$110 \times 2 = 220$$
So… $220 \div 1 = 220$

STEP 2

Step	Bags of M&Ms	Total M&Ms
0	1	110
1	2	***220***
2	5	***550***
3		770

$$1 : 110$$
$$5 : \; ?$$

$$\frac{1}{110} = \frac{5}{?}$$
$$110 \times 5 = 550$$
So… $550 \div 1 = 550$

STEP 3

Step	Bags of M&Ms	Total M&Ms
0	1	110
1	2	***220***
2	5	***550***
3	***7***	770

$$1 : 110$$
$$7 : \; ?$$

$$\frac{1}{110} = \frac{?}{770}$$
$$1 \times 770 = 770$$
So… $770 \div 10 = 7$

Part 5.

Nico has now made it to the pool and is finally ready to swim! Nico is a strong swimmer. Help Nico figure out how many feet Nico can swim per second based on the measures that Nico's friends collect at different times and distances.

Step	Time (seconds)	Distance Swam (feet)
0	2.5	10
1	7.3	
2	12.5	
3		80

STEP 1

Step	Time (seconds)	Distance Swam (feet)
0	2.5	10
1	7.3	***29.2***
2	12.5	
3		80

$$2.5 \ : \ 10$$
$$7.3 \ : \ ?$$

$$\frac{2.5}{10} = \frac{1}{4} = \frac{7.3}{?} \quad \text{(simplify)}$$

$$4 \times 7.3 = 29.2$$

So... $29.2 \div 1 = 29.2$

STEP 2

Step	Time (seconds)	Distance Swam (feet)
0	2.5	10
1	7.3	***29.2***
2	12.5	***50***
3		80

$$2.5 \; : \; 10$$
$$12.5 \; : \; ?$$

$$\frac{2.5}{10} = \frac{1}{4} = \frac{7.3}{?} \quad \text{(simplify)}$$
$$4 \times 12.5 = 50$$
So… $50 \div 1 = 50$

STEP 3

Step	Time (seconds)	Distance Swam (feet)
0	2.5	10
1	7.3	***29.2***
2	12.5	***50***
3	***20***	80

$$2.5 \; : \; 10$$
$$? \; : \; 80$$

$$\frac{1}{4} = \frac{?}{80}$$
$$1 \times 80 = 80$$

So... $80 \div 4 = 20$

Part 6.

Nico is a VERY fast swimmer! It only took 16 seconds for Nico to swim 80 feet. But now Nico is tired. Nancy bets Nico all of the blue M&Ms that she can win a race. Nancy and Nico's friends collected data on the race but it is incomplete. Help Nico fill out the missing data in the table so Nico will know what happened during the race.

Step	Time (seconds)	Nancy's Distance (feet)	Nico's Distance (feet)	Ratio between Nancy & Nico
0	2	5	10	50 %
1	5	10	25	
2	7		30	65%
3	12	28.7		82%
4	Finish	40	40	

STEP 1

Step	Time (seconds)	Nancy's Distance (feet)	Nico's Distance (feet)	Ratio between Nancy & Nico
0	2	5	10	50 %
1	5	10	25	***40%***
2	7		30	65%
3	12	28.7		82%
4	Finish	40	40	

$$\frac{10}{25} = \frac{2}{5}$$
$$\frac{2}{5} = .40$$

$.40 \times 100 = 40\%$

So… 2 to 5 = 40%

STEP 2

Step	Time (seconds)	Nancy's Distance (feet)	Nico's Distance (feet)	Ratio between Nancy & Nico
0	2	5	10	50 %
1	5	10	25	_**40%**_
2	7	_**19.5**_	30	65%
3	12	28.7		82%
4	Finish	40	40	

$$\frac{65}{100} = .65$$
$$.65 = \frac{?}{30}$$
$$.65 \times 30 = 19.5$$
So… 65% = 19.5 to 30

STEP 3

Step	Time (seconds)	Nancy's Distance (feet)	Nico's Distance (feet)	Ratio between Nancy & Nico
0	2	5	10	50 %
1	5	10	25	_**40%**_
2	7	_**19.5**_	30	66%
3	12	28.7	_**35**_	82%
4	Finish	40	40	

$$\frac{82}{100} = \frac{28.7}{?}$$
$$28.7 \times 100 = 82 \times ?$$
$$2870 \div 82 = 35$$

So… 82% = 28.7 to 35

STEP 4

Step	Time (seconds)	Nancy's Distance (feet)	Nico's Distance (feet)	Ratio between Nancy & Nico
0	2	5	10	50 %
1	5	10	25	**_40%_**
2	7	**_19.5_**	30	66%
3	12	28.7	**35**	82%
4	Finish	40	40	**_100%_**

$$\frac{40}{40} = \frac{1}{1}$$
$$1 = 100\%$$

So… 1 to 1 (40%)

Backup.

Nico actually loves blue M&Ms the MOST. Nico decides to rest a little longer and figure out how many blue M&M's there will be depending on how many bags Nico buys.

Step	Total M&Ms	Number of Blue M&Ms
0	110	11
1	220	
2	550	
3	770	

STEP 1

Step	Total M&Ms	Number of Blue M&Ms
0	110	11
1	220	***22***
2	550	
3	770	

$$110 : 11$$
$$220 : ?$$

$$\frac{110}{11} = \frac{220}{?}$$
$$\frac{10}{1} = \frac{220}{?}$$
$$220 \times 1 = 220$$
So… $220 \div 10 = 22$

STEP 2

Step	Total M&Ms	Number of Blue M&Ms
0	110	11
1	220	**_22_**
2	550	**_55_**
3	770	

110 : 11

550 : ?

$$\frac{110}{11} = \frac{550}{?}$$

$$\frac{10}{1} = \frac{550}{?}$$

$550 \times 1 = 550$ **So…** $550 \div 10 = 55$

STEP 3

Step	Total M&Ms	Number of Blue M&Ms
0	110	11
1	220	**_22_**
2	550	**_55_**
3	770	**_77_**

110 : 11

770 : ?

$$\frac{110}{11} = \frac{770}{?}$$

$$\frac{10}{1} = \frac{770}{?}$$

$770 \times 1 = 770$ **So...** $770 \div 10 = 77$