

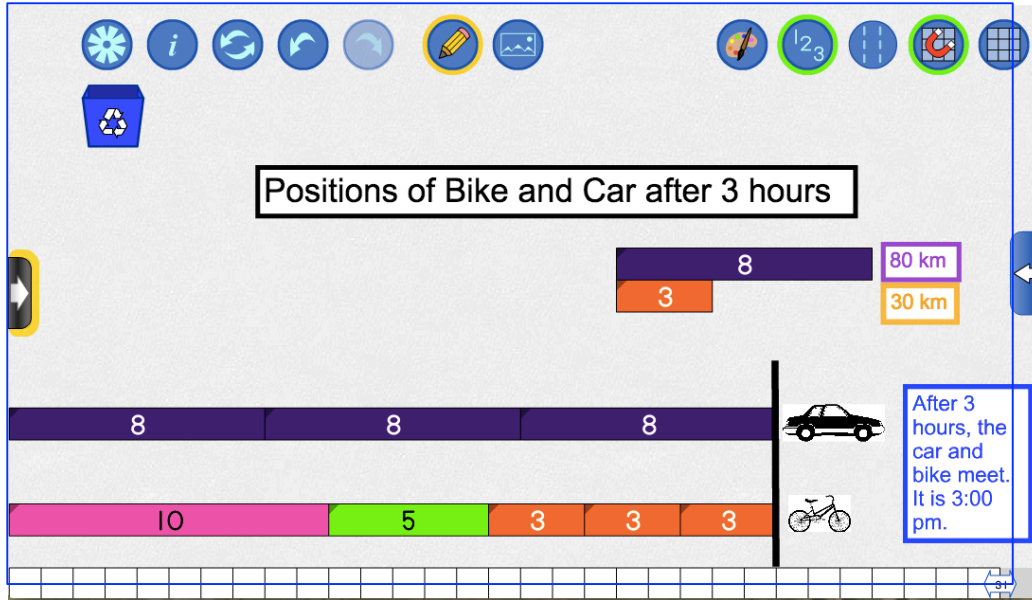
When Will They Meet? Sample Solutions

At noon, a car and a bike start travelling down the same straight road. The car travels at 80 km per hour. The bike travels at 30 km per hour. The bike starts 150 km ahead of the car. At what time will the car and bike meet?

Sample 1:

Whole Number Rods mathies.ca/learningTools.php

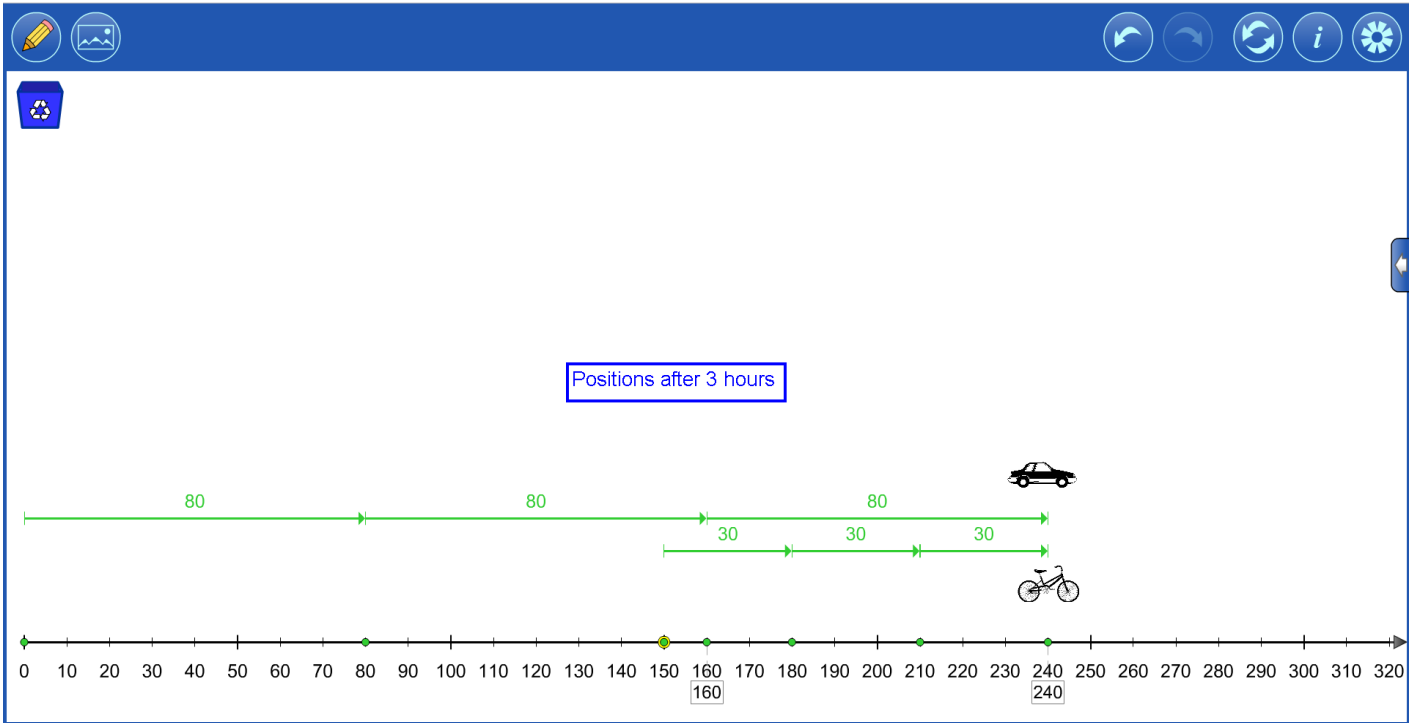
This model is ideal for working with distance.



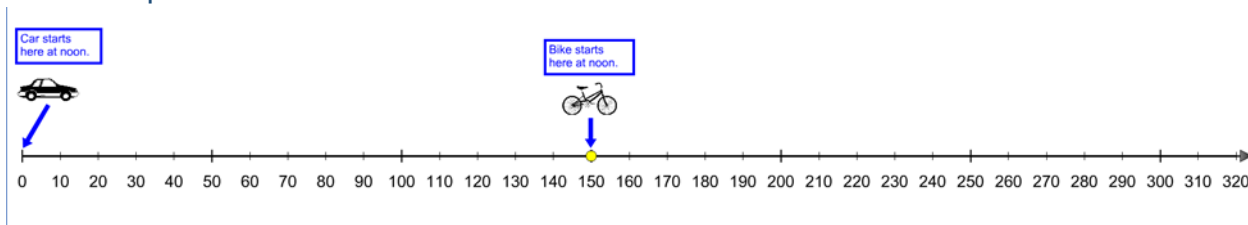
The 150 km head start that the bike has is shown by the pink and green rods at the beginning of the bike's set of rods.

Sample 2:
Number line mathies.ca/learningTools.php

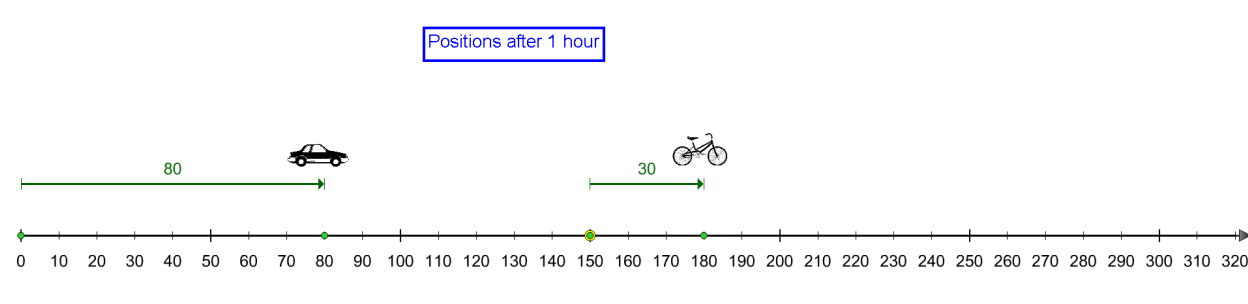
This model is ideal for working with distance.



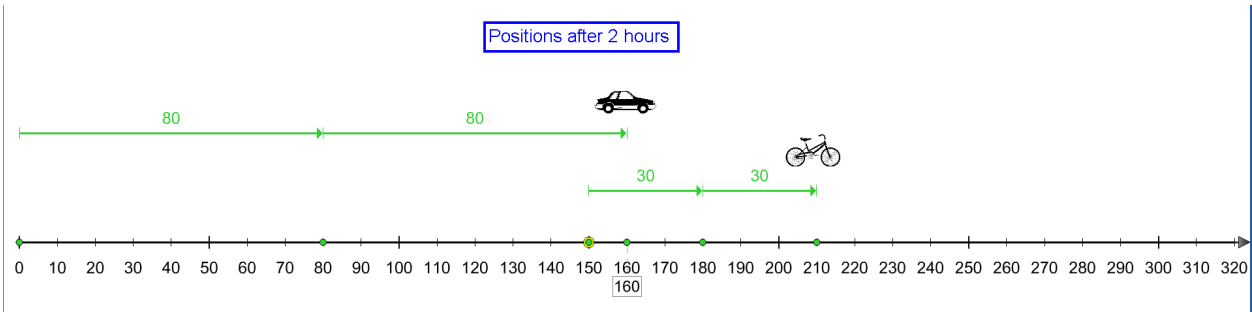
Solutions Steps:



Student marks the starting point for each vehicle on the number line.

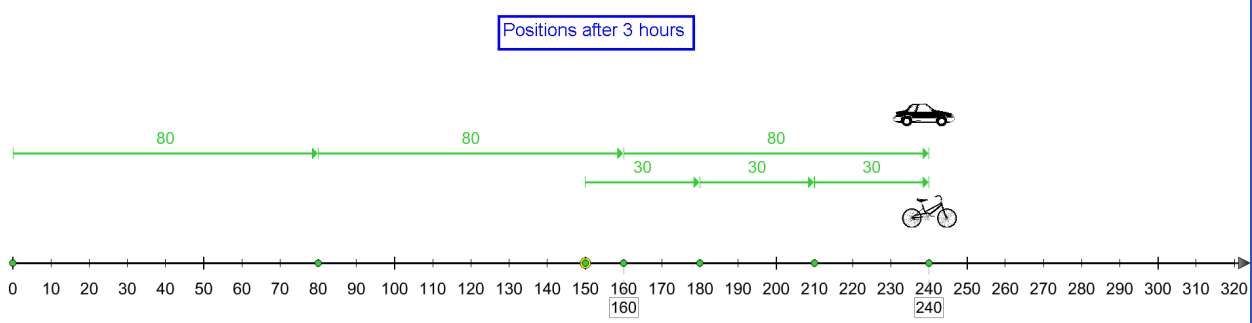


After 1 hour, the car has travelled 80 km. The car has travelled 30 km for a total of 180 km from the starting point.



After 2 hours, the car has travelled a total of 160 km.

The bike has travelled 60 km for a total of 210 km from the starting point.



After 3 hours, the car has travelled a total of 240 km. The bike has travelled 90 km for a total of 240 km.

So the car and bike meet at 3 pm.

Sample 3:

Notepad mathies.ca/learningTools.php

The following solutions consider the starting point to be where the car is at noon.

Graphical Solution using mathies Notepad Tool (mathies.ca/learningTools.php)

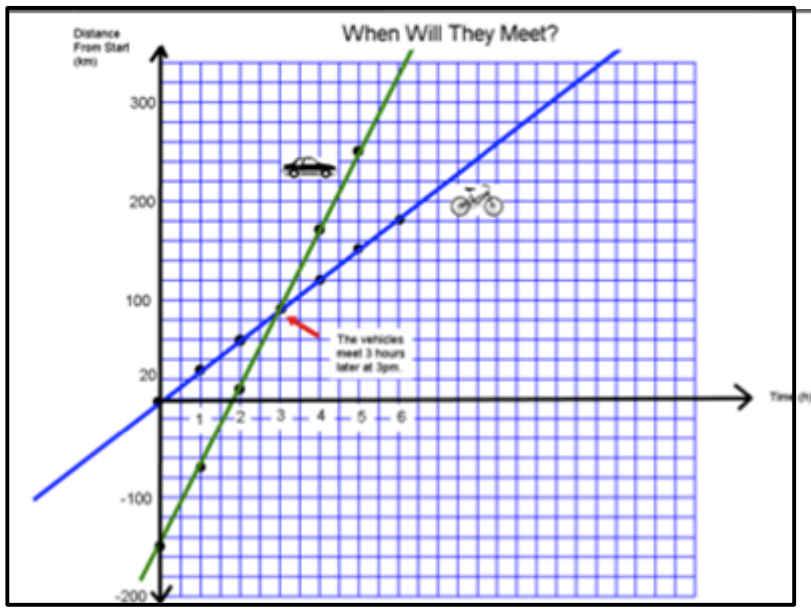


Table of Values

Time (h)	Bike Distance from Start (km)	Car Distance from Start (km)
0	0	-150
1	30	-70
2	60	10
3	90	90
4	120	170
5	150	250

The bike and the car are at the same distance from the start after three hours or at 3:00 p.m.

Algebraic

t represents the amount of time travelled. Bike starts at zero km from start.

$30t$ represents the bike's distance from the start

$80t - 150$ represents the car's distance from the start

To find where they meet, equate these expressions.

$$30t = 80t - 150$$

$$-50t = -150$$

$$t = 3$$

Sample 4:

Notepad mathies.ca/learningTools.php

The following solutions consider the starting point to be where the bike is at noon.

Graphical Solution using mathies Notepad Tool (mathies.ca/learningTools.php)

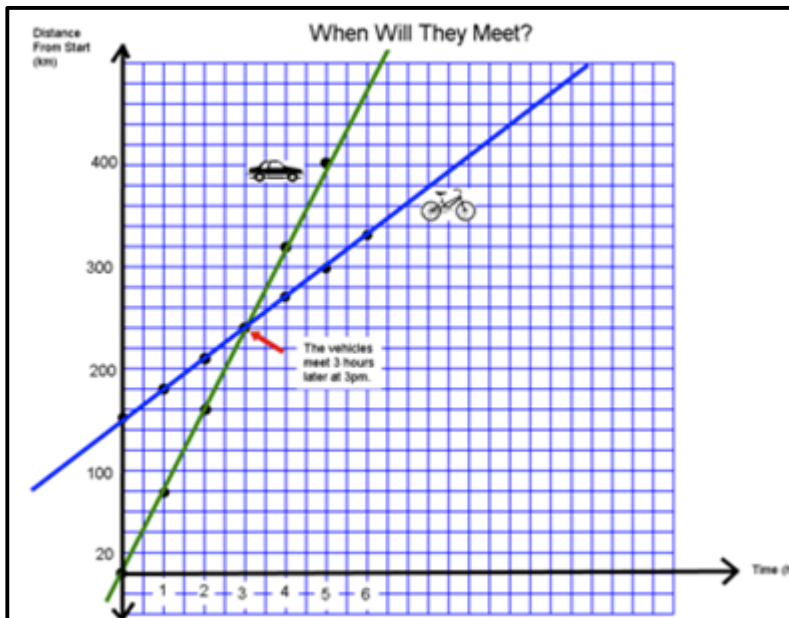


Table of Values

Time (h)	Car Distance from Start (km)	Bike Distance from Start (km)
0	0	150
1	80	180
2	160	210
3	240	240
4	320	270
5	400	300

The car and the bike are at the same distance from the start after three hours or at 3:00 p.m.

Algebraic

t represents the amount of time travelled. Car starts zero km from start.

$80t$ represents the car's distance from the start

$30t + 150$ represents the bike's distance from the start

To find where they meet, equate these expressions.

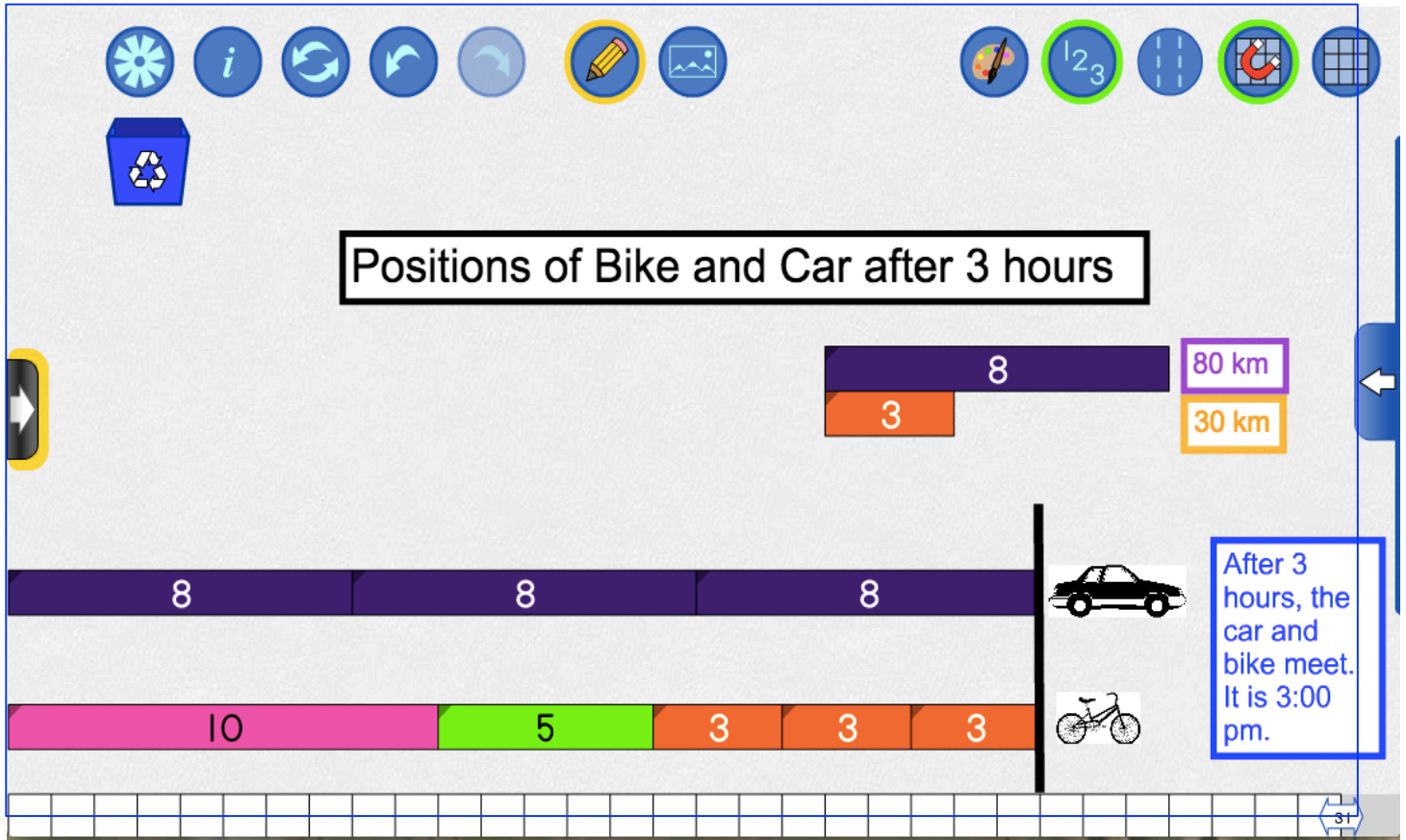
$$80t = 30t + 150$$

$$50t = 150$$

$$t = 3$$

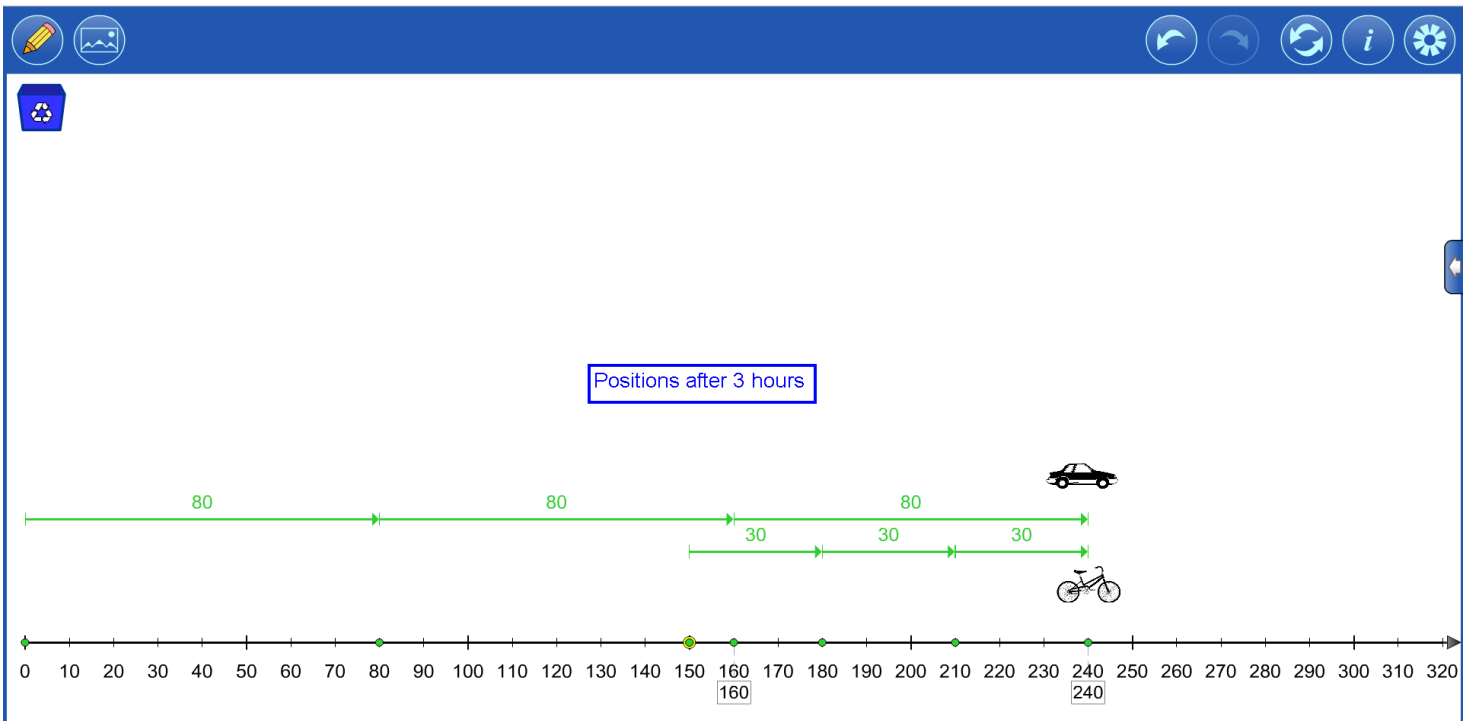
Appendix A: Solutions for posting.

Solution 1



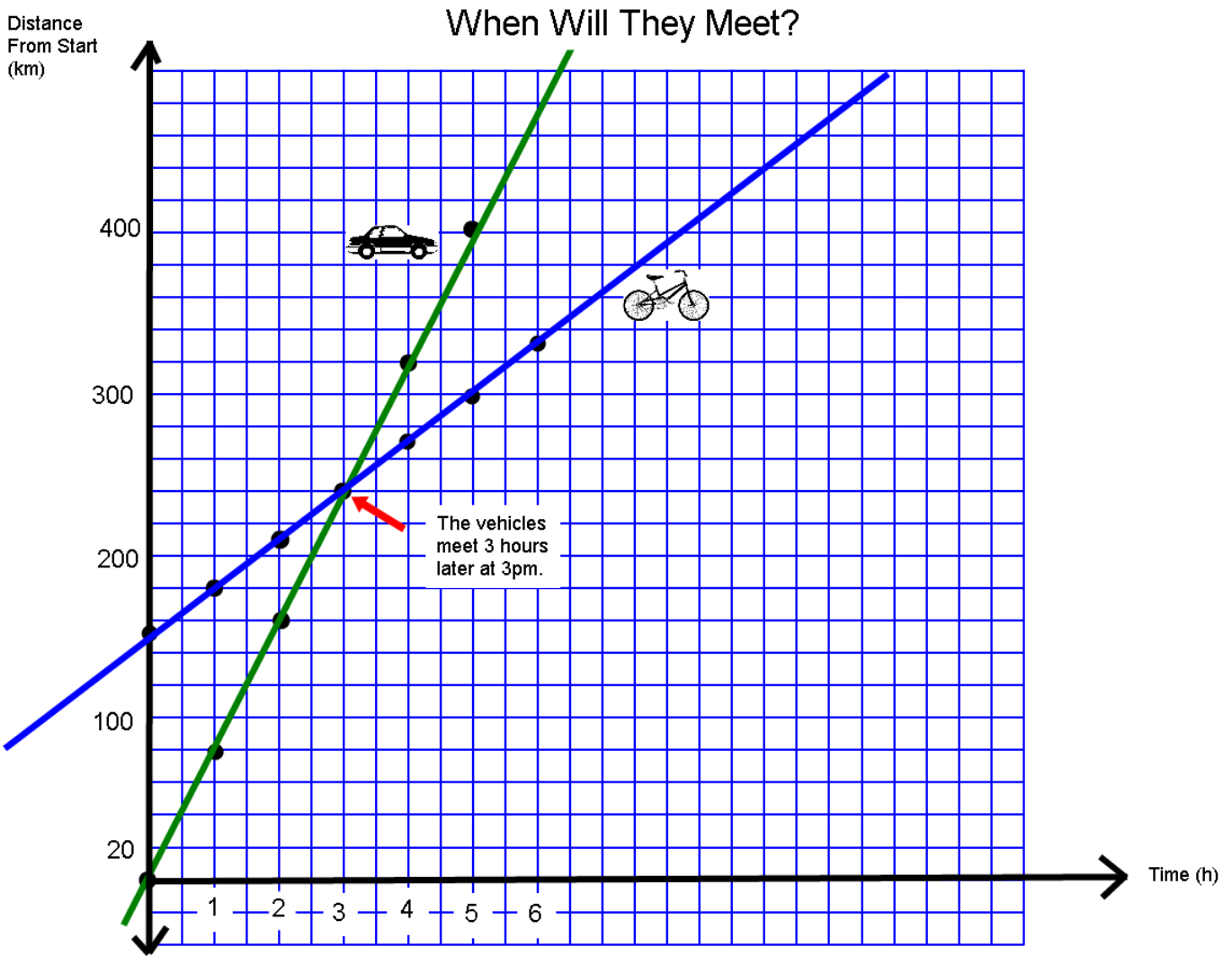
This solution was created using the Whole Number Rods learning tool found at mathies.ca.

Solution 2



This solution was created using the Number Line learning tool found at mathies.ca.

Solution 3



Time (h)	Car Distance from start (km)	Bike Distance from start (km)
0	0	150
1	80	180
2	160	210
3	240	240
4	320	270
5	400	300

They meet at 3 pm, 3 hours after they start.

Solution 4

Let t represent the amount of time travelled.

Car starts 0 km from the start

$80t$ represents the car's distance from the start

$150 + 30t$ represents the bike's distance from the start

To find where they meet, equate these expressions.

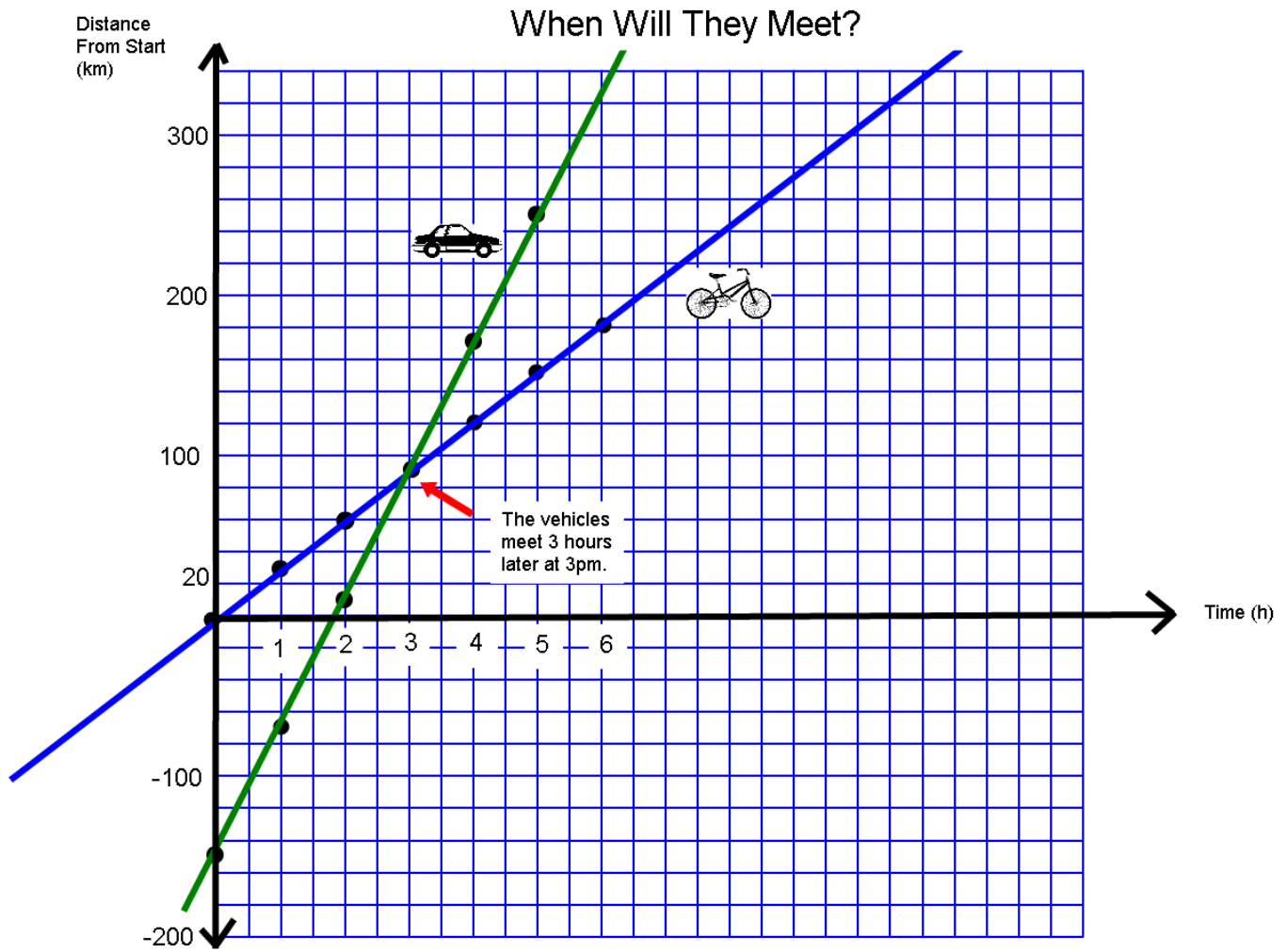
$$150 + 30t = 80t$$

$$150 = 50t$$

$$t = 3$$

The bike and car meet at 3:00 pm, 3 hours after starting.

Solution 5



The bike and car meet at 3 pm, 3 hours after starting.

Solution 6

Time (h)	Bike Distance from start (km)	Car Distance from start (km)
0	0	-150
1	30	-70
2	60	10
3	90	90
4	120	170
5	150	250

The bike and car meet at 3 pm, 3 hours after starting.

Solution 7

Let t represent the amount of time travelled.

Bike starts 0 km from start

$30t$ represents the bike's distance from the start

$80t - 150$ represents the car's distance from the start

To find where they meet, equate these expressions

$$30t = 80t - 150$$

$$-50t = -150$$

$$t = 3$$

The bike and car meet at 3 pm, 3 hours after starting.