

Jason left the parking lot at 6:00 pm traveling 30mph. Iman left the same parking lot at 7:00pm traveling 40mph. Write and solve an equation to find out at what time Iman will catch up to Jason.

	Distance	=	Rate	•	Time
Jason	$30t$		30		$t$
Iman	$40(t-1)$		40		$t-1$

→ 4 hrs

10:00 pm

$$\begin{aligned}
 30t &= 40(t-1) \\
 30t &= 40t - 40 \\
 -30t & \quad -30t
 \end{aligned}$$

$$\begin{aligned}
 0 &= 10t - 40 \\
 +40 & \quad +40 \\
 40 &= 10t \\
 \frac{40}{10} &= \frac{10t}{10} \quad t=4
 \end{aligned}$$

### Opposite Direction Travel

1/2 sheet

Omar heads due east in his boat and sails for 4 hours. Dwayne heads due west in his boat 5 faster than Omar and sails for 3 hours.

When they both have stopped they are 127 miles apart.

Write and solve an equation to find out how fast they were both traveling.

What do you do with their distances?

	Distance	=	Rate	•	Time
Omar					
Dwayne					

### Opposite Direction Travel:

Two people start at the same spot and travel in opposite directions. What is true about the distances traveled?

The distance they are apart equals the SUM of their distances.

Two planes leave the same airport at the same time traveling in opposite directions. One plane travels 40 mph slower than the other plane. After 6 hours they are 4560 miles apart. Find how fast each plane is traveling.

The sum of the planes distances equals 4560

400 mph & 360 mph

	Distance	=	Rate	•	Time
1st	$6x$		$x$		6
2nd	$6(x-40)$		$x-40$		6

$$\begin{aligned}
 x &= 400 \\
 x - 40 &= 360
 \end{aligned}$$

$$\begin{aligned}
 6x + 6(x-40) &= 4560 \\
 6x + 6x - 240 &= 4560 \\
 12x - 240 &= 4560 \\
 +240 & \quad +240 \\
 12x &= 4800 \\
 x &= 400 \text{ mph}
 \end{aligned}$$

1. Andy went for a walk at 4 mph. After reaching his destination he turned around and walked back along the same path at 6 mph. The total time Andy spent walking was 3 hours. Write and solve an equation to find the amount of time he spent walking each way.

	Distance	=	Rate	•	Time
AWAY	$4t$		4		$t$
BACK	$6(3-t)$		6		$3-t$

1.8 hrs

1.2 hrs

Andy walked 1.9 away and 1.2 on the way back.

practice sheet

$$4t = 6(3-t)$$

$$4t = 18 - 6t$$

$$+6t \quad +6t$$

$$\frac{10t}{10} = \frac{18}{10}$$

$$t = 1.8 \text{ hrs}$$

2. Mr. Amen left on his boat at 9:00 am and sailed at 12 mph. Mr. Richards left on his boat at 9:30 am and sailed at 15 mph trying to catch up with Mr. Amen. At what time of day will Mr. Richard catch up with Mr. Amen?

	Distance	=	Rate	•	Time
Amen	$12t$		12		$t$
Richards	$15(t-0.5)$		15		$t-0.5$

2 1/2 after 9:00 am

11:30 am

$$12t = 15(t-0.5)$$

$$12t = 15t - 7.5$$

$$-15t \quad -15t$$

$$\frac{-3t}{-3} = \frac{-7.5}{-3} \quad t = 2.5$$

3. You jog 6 mph and your friend jogs 8 mph. You both leave your house and jog in opposite directions. The total time spent running between you and your friend is  $3 \frac{1}{2}$  hours. When you both stop you are  $23 \frac{1}{2}$  miles apart. Find the time each of you spent jogging.

	Distance	=	Rate	•	Time
You	$6t$		6		$t$
friend	$8(3.5-t)$		8		$3.5-t$

$$t = 2.25$$

$$3.5 - t = 3.5 - 2.25 = 1.25$$

You jogged 2.25 hours away from home and 1.25 hours back home.

The sum of their distances is 23.5 miles

$$6t + 8(3.5 - t) = 23.5$$

$$6t + 28 - 8t = 23.5$$

$$-2t + 28 = 23.5$$

$$\quad -2t \quad -2.5$$

$$\frac{-2t}{-2} = \frac{-4.5}{-2}$$