

Speed, Time and Distance problems

Parent Copy

If your child is having problems with word problems in algebra or you want him in tip top shop for his/her SAT/ACT tests, this set of exercises will get you there. Print and give the second part without the answers to your student. Ask student to do these problems verbally. The problems get progressively harder as new concepts are introduced. At the end of this section, you will be amazed how even hard problems can be solved with resorting to pencil and paper. It's like magic but then good math education should produce an ability to do these problems rapidly.

Some abbreviations

Km/hr – stands for kilometers per hour

Mph – stands for miles per hour

Fps – feet per second

Cpm - cycles per minute

Mps – meters per second

1. A car travels 30 km in $\frac{1}{2}$ hours. What is its average speed in km/hr?

Ans: 60 km/hr

2. A donkey goes $\frac{2}{3}$ km in 20 minute. What is its average speed km/hr?

Ans: 2 km/hr

3. A dog runs 2.5 km in $\frac{1}{2}$ hour. What is its average speed in km/hr?

Ans: 5 km/hr

4. A car drives 1 km in one minute. How fast it going in km/hr? **Ans:** 60 km/hr

5. At a speed s, how long would it take to cover the distance d? **Ans:** $t = d/s$

6. At a speed of s, and time t, how much distance can be covered? **Ans:** $d = s t$

7. I drive 18 mph for 10 minutes and then 24 mph for 20 minutes. What is my average speed? **Ans:** 22 mph

8. I drive 30 mph for quarter of an hour, and then 60 mph for 45 minutes. What is my average speed? **Ans:** 52 $\frac{1}{2}$ mph

9. How far will a man travel in 12 days at the rate of 36 miles in 4 days? **Ans:** 108 miles

10. Wilkinson walked 7 hours, at the rate of 12 miles in 4 hours; how far did he walk? **Ans:** 21 miles

11. How far can Ann walk in 4 days, if in $\frac{5}{6}$ of a day she can walk 20 miles? **Ans:** 96 miles

12. How far can Mandy walk in 48 days, if she walks 30 miles in 4 days?

Ans: In 48 days, which is 12 times 4 days, she will travel 12 times 30 miles, or 360 miles.

13. How far can Harry walk in 10 hours, if he can walk $6\frac{2}{5}$ miles in 2 hours?

Ans: In 2 hours he walks $32/5$ miles. So in 10 hours, he walks five times that or 32 miles.

79. I go up a hill at the speed of 3 mph and I run down the same hill at a speed of 6 mph. What is my average speed for the round trip, if the total distance is 2 miles?

Ans: Total time = $\frac{1}{2}$ hours, total distance = 2 mi, average speed = 4 mph. Note we can not average the two speeds here because the distance is the same and not the time.

80. If the distance traveled on two segments is the same, then we can compute the average speed by averaging the speeds on the two segments. True or False **Ans:** False

81. If the time spent traveling on two segments is the same, then we can compute the average speed by averaging the speeds on the two segments. True or False **Ans:** True

82. If the distance traveled is the same on two segments, then time it takes to travel them is in same proportion as the speeds. True or false.

Ans: False. The time is inversely proportional to speed. The faster speed means it will take less time to cover that distance

83. I travel a distance d at speed v_1 and on return trip I travel the same distance at speed v_2 . What is total time it took me cover the round trip distance? **Ans:** $d/v_1 + d/v_2 = d(v_1 + v_2)/(v_1 \times v_2)$

84. I travel 10 miles at 30 mph and then drive at 40 mph on the return trip. How much time did it take me to cover this distance?

Ans: $1/3$ hr + $1/4$ hr or $7/12$ hr

85. I travel 10 miles at 30 mph and then go 40 mph on the return trip. What its my average speed?

Ans: 20 miles in $7/12$ hr or $34 \frac{2}{7}$ mph

86. A car is moving at the speed of 30 mph. Another car is moving at the speed of 20 mph towards the first car. At what speed are they moving towards each other? **Ans:** 50 mph

87. A SouthWest Airlines plane leaves Kansas for Los Angeles at the speed of 400 mph. A Delta Airlines airplane also leaves Kansas for New York at the speed of 500 mph. At what speed are they moving away from each other? **Ans:** 900 mph

88. An airplane flies at the speed of 200 mph. A fast car is traveling in the same direction at a speed of 80 mph. At what rate is the airplane gaining on the car? **Ans:** 120 mph

89. A boy runs at the speed of 8 mph. Another boy runs at the speed of 9 mph. At the end of half hour, how much farther will be the second boy? **Ans:** $\frac{1}{2}$ mile

90. My friends leave for a camping trip in a bus at the speed of 50 mph. I leave one hour later at the speed of 70 mph. The campground is 210 miles away. Will I get there before them? **Ans:** Yes

91. Mike drives from Miami to New York at an average speed of 80 mph. Jim leaves Miami flying to New York two hours later at a speed of 400 mph. How long will it be in hours before the airplane passes Mike in his car?

Ans: Jim is overtaking Mike at the speed of 320 mph. Mike has a head start of 160 miles. It will take the airplane half an hour to pass Mike.

97. How far can a person ride a bike at the rate of 12 miles per hour, provided he is gone total of 6 hours, and runs back at the rate of 6 miles per hour? **Ans:** 24 miles.

98. A steamboat goes up the river at a speed of 24 km/hr and goes down the river at a speed of 30 km/hr. What is the speed of the river current?

Ans: The upriver speed is reduced by the same amount as the downriver speed is increased by the river current. So the difference between the two equals two times the speed of the current. So the speed of the current = 3 km/hr.

By algebra, we can also see that if x is the speed of the boat in still water and r is the current speed, then, $24 = x - r$ and $30 = x + r$. If we subtract first expression from second expression, we get $2r = 6$, or $r = 3$.

99. What is the rate of the current of a river if a man can row down stream 10 miles an hour and up stream 6 miles an hour?

Ans: 2 mph. This problem looks harder than it is. The speed of the current is just one half of the difference of the upstream and downstream speeds.

100. An airplane flies from San Diego to Washington in 6 hours. On the return trip, it takes only 5 hours. The distance from San Diego to Washington, D.C. is 3000 miles. What is wind speed?

Ans: The speed to Washington is $3000/6 = 500$ mph. The speed back is $3000/5 = 600$ mph. The wind speed is two times the difference between these two speeds. So the wind speed was 50 mph.

101. A boat goes up a river at 4 miles per hour and down the river at 8 miles per hour. The boat was gone 18 hours, how long did it take to return?

Ans: For every one hour that he takes to go down river, it takes him 2 hours to go up river. We can write expression $18 = x + 2x$, or we can say that we need to divide 18 into two parts such that one part is double the other. The return time is 6 hours and upriver time is 12 hours.

102. A girl rows upstream to a picnic spot. It takes her 3 hours to reach the picnic spot. When she rows back, it takes her only one hour. At what speed did she row and what is the speed of the river current if the distance is 6 miles?

Ans: If the distance is the same and time is 3 times longer, that means the upstream speed must be $1/3$ of the downstream speed. Her upstream speed is 6 mph divided by 3 or 2 mph. Her downstream speed must be 6 mph. So her rowing speed must be river's speed minus 2 mph. But this is also equal to rowing speed plus 2 which is equal to 6. Her rowing speed must be 4 mph.

103. Jack drives to the park at the speed of 20 mph. Nina drives from the park to home at the same speed. The park is 5 miles from home. At what point will they meet? (How far from home?)

Ans: 2.5 miles. (Note that both are going at the same speed, so meeting in the middle seems sensible.)

104. A boatman whose rate down a river is 2 times his rate upstream, made a round trip between two points in 6 hours. How long did it take him on the return trip?

Ans: 2 hours. If the speed was double, then for the same distance, it must take half the time to go down river. The ratio of times is 1: 2 for upriver to