

DO NOW

Put last night's homework on the board.

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2.1 Distance Word Problems

$$d = rt$$

set up charts:

| r | t | d |
|---|---|---|
| | | |

Fill in with information from the problem
Use $d = rt$
* multiply the 1st two columns

**Clarify the relationship of the distances (draw a sketch)

+ → given a total distance

= → given the same distance

- → given a difference between the miles

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Examples:

1. Jennifer started driving at 40 mi/hr. Sue left 3 hours later from the same starting point driving along the same road at 55 mi/hr. How long did it take for Sue to catch up to Jennifer?

* Jennifer drove longer

let x = Sue's time
 $x + 3$ = Jennifer's time

$$\begin{aligned} d_{\text{Sue}} &= d_{\text{Jennifer}} \\ 55x &= 40(x+3) \\ 55x &= 40x + 120 \\ 55x - 40x &= 120 \\ 15x &= 120 \\ x &= \frac{120}{15} \\ x &= 8 \end{aligned}$$

* Given rates - put in chart 1st

| | r | t | d |
|----------|----|-------|-----------|
| Jennifer | 40 | $x+3$ | $40(x+3)$ |
| Sue | 55 | x | $55x$ |

Variables
don't look in reading

sketch:
Jennifer
Sue
distances are =

It took Sue 8 hours.

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2. Sabrina drove from her home to her mother's home, which is 150 miles away. For the first half hour, she drove on local roads. For the next two hours she drove on an interstate highway and increased her average speed by 15 miles per hour. Find Sabrina's average speed on the local roads and on the interstate highway.

let x = local road rate
 $x + 15$ = interstate rate

$$\begin{aligned} d_{\text{local}} + d_{\text{interstate}} &= 150 \\ .5x + 2(x+15) &= 150 \\ .5x + 2x + 30 &= 150 \\ .5x + 2x &= 150 - 30 \\ 2.5x &= 120 \\ x &= \frac{120}{2.5} \\ x &= 48 \end{aligned}$$

* Given times - put in 1st

| | r | t | d |
|------------|--------|----|-----------|
| local | x | .5 | $.5x$ |
| interstate | $x+15$ | 2 | $2(x+15)$ |

sketch:
Sabrina local interstate Mom
150 miles
add

local roads = 48 mph
interstate = 63 mph

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3. Two trains traveled in opposite directions from the same starting point. The rate of one train was 20 km/hr faster than the rate of the other. After 2 hours, they were 360 km apart. Find the rate of each train.

let x = Train 2 rate
 $x + 20$ = Train 1 rate

| | r | t | d |
|---------|--------|---|-----------|
| Train 1 | $x+20$ | 2 | $2(x+20)$ |
| Train 2 | x | 2 | $2x$ |

$$\begin{aligned} d_{T_1} + d_{T_2} &= 360 \\ 2(x+20) + 2x &= 360 \\ 2x + 40 + 2x &= 360 \\ 2x + 2x &= 360 - 40 \\ 4x &= 320 \\ x &= \frac{320}{4} \\ x &= 80 \end{aligned}$$

sketch:
Train 1 Train 2
360 km
add

Train 1 rate = 100 km/hr
Train 2 rate = 80 km/hr

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HOMEWORK

Worksheet - HW 2.1 Distance Problems

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