

2-3 D3 Notes

Wednesday, October 18, 2023 10:01 AM

Solve. For each, define a variable, translate into an equation, then find the answer to the question. A chart or a picture may be helpful.

24. A car traveling at 56 mph overtakes a cyclist who, traveling at 14 mph, had a 1.5-hour head start. How far from the starting point does the car overtake the cyclist?

Let $x = \text{time of car}$

$$56x = 14(x + 1.5)$$

$$56x = 14x + 21$$

$$-14x \quad -14x$$

$$\frac{42x}{42} = \frac{21}{42}$$

$$x = \frac{1}{2}$$

is this distance?

No, $\frac{1}{2}$ hour

rate $\times$ time = distance

car	56	x	$56x$
bike	14	$x + 1.5$	$14(x + 1.5)$

same

$56\left(\frac{1}{2}\right) = \text{distance}$

28 mi

28. A ferry leaves a harbor and travels to a resort island at an average speed of 20 mph. On the return trip, the ferry travels at an average speed of 12 mph because of fog. The total time for the trip is 5 h. How far is the island from the harbor?

Let $x = \text{time back}$

$$20(5-x) = 12x$$

$$100 - 20x = 12x$$

$$+20x \quad +20x$$

$$\frac{100}{32} = \frac{32x}{32}$$

$$3.125 = x$$

time in hrs

Not distance

rate $\times$ time = distance

there	20	$5-x$	$20(5-x)$
back	12	x	$12x$

same

$12(3.125)$

37.5 mi