

# RECAP 11

Name \_\_\_\_\_

Date \_\_\_\_\_

## Planning a Trip

In this lesson, we

- used equations to represent the time and distance of a trip.
- solved an equation that represents the time and distance of a trip to find whether it takes less time to drive or fly for the trip.

## Examples

1. Ship A left port and sailed west at the constant rate of 20 miles per hour. One hour later, ship B left the same port and sailed west at the constant rate of 25 miles per hour. How many hours does it take for ship B to catch up with ship A?

Read

What does this problem ask you to find?

How many hours it takes for ship B to catch up to ship A

What do you know?

Ship A's speed is 20 miles per hour.

Ship B leaves 1 hour after ship A. Ship B's speed is 25 miles per hour.

Let  $h$  represent the number of hours ship A has been sailing. Then  $h - 1$  represents the number of hours ship B has been sailing.

Represent

$$20h = 25(h - 1)$$

$$20h = 25h - 25$$

$$20h - 20h = 25h - 20h - 25$$

$$0 = 5h - 25$$

$$0 + 25 = 5h - 25 + 25$$

$$25 = 5h$$

$$5 = h$$

Solve

Does the result make sense?

Yes, 5 checks when substituted in the expressions.

Does the result answer the question?

Yes, the variable represents a time, so 5 hours is reasonable. The distance  $5(20)$ , or 100, miles makes sense for the situation.

Check:

Left side:  $20(5) = 100$

Right side:  $25(5 - 1) = 25(4) = 100$

It takes 5 hours for ship B to catch up with ship A.

Summarize

2. Nora sends three less than half the number of text messages Henry sends. Dylan sends eight more than a third of the number of text messages Henry sends.

Together, Nora and Dylan send the same number of text messages as Henry. How many text messages does each person send?

Read

What does this problem ask you to find?

How many text messages each person sends

What do you know?

Nora sends three less than half the number of text messages Henry sends.

Dylan sends eight more than a third of the number of text messages Henry sends.

Nora and Dylan together send the same number of text messages as Henry.

Let  $x$  represent the number of text messages Henry sends. Then  $\frac{1}{2}x - 3$  represents the number of text messages Nora sends, and  $\frac{1}{3}x + 8$  represents the number of text messages Dylan sends.

Represent

$$\left(\frac{1}{2}x - 3\right) + \left(\frac{1}{3}x + 8\right) = x$$

$$\frac{5}{6}x + 5 = x$$

$$5 = \frac{1}{6}x$$

$$30 = x$$

Solve

Does the result make sense?

Yes, 30 checks when substituted in the expressions.

Does the result answer the question?

Yes, the variable represents a number of text messages, so 30 text messages is reasonable. The number of text messages for Nora, 12, and Dylan, 18, are also reasonable.

Check:

Left side:  $\left(\frac{1}{2}(30) - 3\right) + \left(\frac{1}{3}(30) + 8\right) = 12 + 18 = 30$

Right side: 30

Nora sends 12 text messages, Dylan sends 18 text messages, and Henry sends 30 text messages.

Summarize