



EXAMPLE 5 TAKS REASONING Q Multiple-Step Problem

MOVIE RENTAL A video store rents new movies for one price and older movies for a lower price, as shown at the right.

- Write an equation that represents the store's monthly revenue.
- Solve the revenue equation for the variable representing the number of new movies rented.
- The owner wants \$12,000 in revenue per month. How many new movies must be rented if the number of older movies rented is 500? 1000?



Solution

STEP 1 Write a verbal model. Then write an equation.

Monthly revenue (dollars)	=	Price of new movies (dollars/movie)	•	Number of new movies (movies)	+	Price of older movies (dollars/movie)	•	Number of older movies (movies)
↓		↓		↓		↓		↓
R	=	5	•	n_1	+	3	•	n_2

An equation is $R = 5n_1 + 3n_2$.

STEP 2 Solve the equation for n_1 .

$$R = 5n_1 + 3n_2 \quad \text{Write equation.}$$

$$R - 3n_2 = 5n_1 \quad \text{Subtract } 3n_2 \text{ from each side.}$$

$$\frac{R - 3n_2}{5} = n_1 \quad \text{Divide each side by 5.}$$

STEP 3 Calculate n_1 for the given values of R and n_2 .

If $n_2 = 500$, then $n_1 = \frac{12,000 - 3 \cdot 500}{5} = 2100$.

If $n_2 = 1000$, then $n_1 = \frac{12,000 - 3 \cdot 1000}{5} = 1800$.

- ▶ If 500 older movies are rented, then 2100 new movies must be rented.
- ▶ If 1000 older movies are rented, then 1800 new movies must be rented.

GUIDED PRACTICE for Example 5

- WHAT IF?** In Example 5, how many new movies must be rented if the number of older movies rented is 1500?
- WHAT IF?** In Example 5, how many new movies must be rented if customers rent *no* older movies at all?
- Solve the equation in Step 1 of Example 5 for n_2 .