

4.7

Applications and Problem Solving

OBJECTIVES

- a Solve applied problems involving decimals.

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EXAMPLE A Cost of Color Copies

The Copy Center is having a sale on color copies. The cost of a color copy is now 12 cents per page. You need to copy 530 flyers for your employer. How much, in dollars, would it cost?



Solution

530 copies

Familiarize. We make a drawing or at least visualize the situation. We let d = the number of dollars.

- a Solve applied problems involving decimals.

EXAMPLE A Cost of Color Copies

Solve. To solve the equation we carry out the multiplication.

$$\begin{array}{r} 530 \\ \times .12 \\ \hline 1060 \\ 5300 \\ \hline 63.60 \end{array}$$

Thus, $d = \$63.60$.

- a Solve applied problems involving decimals.

EXAMPLE B Computer Payment Plan

Bridget is purchasing a new computer for \$2826. She is borrowing the money from the bank and needs to pay it back in equal monthly payments for two years. How much does she pay each month?



- a Solve applied problems involving decimals.

EXAMPLE B Computer Payment Plan

Translate. The amount is divided into payments of equal size. The amount of the payment will depend on the number of payments.

In two years there are: $12 \cdot 2 = 24$ months

Amount

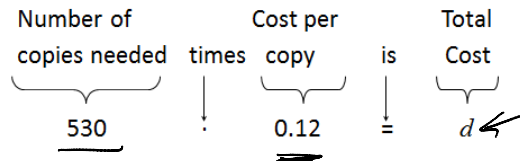
| | | | |
|--------------------|-----------------------|-------------------|--------------------|
| Of monthly Payment | Total Payment is owed | Number divided by | Number of payments |
| m | $= \$2826$ | \div | 24 |

EXAMPLE B Computer Payment Plan

- a Solve applied problems involving decimals.

EXAMPLE A Cost of Color Copies

Translate.



- a Solve applied problems involving decimals.

EXAMPLE A Cost of Color Copies

Check. We can check using approximation:

$$\underline{530} \cdot \underline{0.12} \approx 530 \cdot \underline{0.10} = 53.00$$

Note that 12 cents is larger than 10 cents so our answer makes sense.

State. It would cost \$63.60 to make 530 flyers.

- a Solve applied problems involving decimals.

EXAMPLE B Computer Payment Plan

Solution

Familiarize. Money is borrowed and repaid in equal monthly payments. We need to determine how many months are in two years. We let m = the size of each monthly payment.

- a Solve applied problems involving decimals.

EXAMPLE B Computer Payment Plan

Solve. Carry out the division.

$$\begin{array}{r} 117.75 \\ 24 \overline{)2826.00} \\ \underline{24} \\ 42 \\ \underline{24} \\ 186 \\ \underline{168} \\ 180 \\ \underline{168} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

$$m = \$2826 \div 24$$

EXAMPLE B Computer Payment Plan

Check. To check, we first verify that there are 24 months in 2 years.

$$24 \div 12 = 2 \text{ years.}$$

To check the monthly payment, estimate the product

$$\$100 \cdot 24 = \$2400$$

State. Bridget's monthly payments would be \$117.75.

a Solve applied problems involving decimals.

EXAMPLE C Find the Area

Solve. We solve by carrying out the multiplication.

$$\begin{array}{r} 20.4 \\ \times 32.6 \\ \hline 1224 \\ 4080 \\ 61200 \\ \hline 665.04 \end{array}$$

Check. We can obtain a partial check by estimating the product: $A = 20 \cdot 33 = 660$. This estimate is close so it's a good check.

State. The area of the poster is 665.04 square inches.

a Solve applied problems involving decimals.

EXAMPLE C Amount of Trees Planted

Familiarize. Suppose the division uses the tractor for 5 hours. Then the cost would be $\text{daily rate} + \text{cost per hour} \cdot \text{number of hours}$.
 $\$87.95 + \$4.25 \cdot 5 = \$109.20$
 Let $h = \text{number of hours used}$

Tractor for 1 hour \leftarrow 92.20

$$\begin{array}{r} 12 \cdot 10.10 \\ - 92.20 \\ \hline 27.80 \end{array}$$

a Solve applied problems involving decimals.

EXAMPLE C Amount of Trees Planted

Check. We check in the original problem.

$$\text{Multiply } 7.5 \text{ times } \$4.25 = \$31.88$$

Add $\$87.95 = \119.83 , which is just less than the allotted \$120.

State.

The Soil and Water district can use the tractor for 7.5 hours per day.

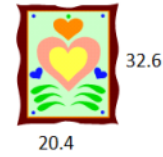
a Solve applied problems involving decimals.

EXAMPLE C Find the Area

A poster for an art exhibit has dimensions 20.4 in by 32.6 in. Find the area.

Solution

Familiarize. We first make a drawing. We let $A = \text{the area}$.



Translate. We use the formula

$$A = l \cdot w \text{ and substitute.}$$

$$A = 32.6 \cdot 20.4$$

(continued)

a Solve applied problems involving decimals.

EXAMPLE C Amount of Trees Planted

The Fulton County Soil and Water division has rented a tractor for \$87.95 per day plus \$4.25 an hour to assist in planting trees. They have budgeted \$120 per day for renting a tractor to plant trees in the county. For how many hours can they plant trees without exceeding the budget?

\$87.95 per day

\$4.25 per hour



$$\begin{array}{r} 120 \\ - 88 \\ \hline 32 \end{array}$$

$$\frac{32}{4} \approx 8 \text{ hrs.}$$

a Solve applied problems involving decimals.

EXAMPLE C Amount of Trees Planted

Translate.

$$\text{daily rate} + \text{cost per hour} \cdot \text{number of hours} = \text{cost}$$

$$\$87.95 + \$4.25 \cdot h = \$120$$

$$\text{Solve. } 87.95 + 4.25h = 120$$

$$4.25h = 32.05$$

$$h = \frac{32.05}{4.25}$$

$$h = 7.5$$

Subtracting 87.95 from both sides
 Dividing both sides by 4.25
 Rounding to the nearest tenth (continued)

Hoo Ray!