Solve Multistep Problems Using Equations

Essential Question How can you represent and solve multistep problems using equations?

Unlock the Problem Real World

Crismari's computer has 3 hard drives with 64 gigabytes of space each and 2 hard drives with 16 gigabytes of space each. The files on her computer use 78 gigabytes of space. How much hard drive space does her computer have left?

- Underline the important information.

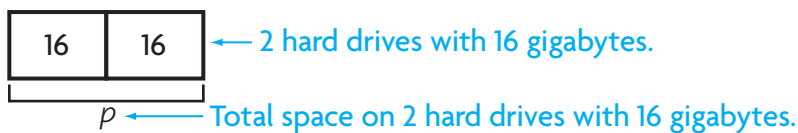### One Way Use multiple single-step equations.

STEP 1 Find how much hard drive space is on 3 hard drives with 64 gigabytes of space each.

64	64	64

← 3 hard drives with 64 gigabytes.

n ← Total space on 3 hard drives with 64 gigabytes.

$3 \times 64 = n$

_____ $= n$

STEP 2 Find how much hard drive space is on 2 hard drives with 16 gigabytes of space.

16	16

← 2 hard drives with 16 gigabytes.

p ← Total space on 2 hard drives with 16 gigabytes.

$2 \times 16 = p$

_____ $= p$

STEP 3 Find the total hard drive space on the computer.

Total space on 64-gigabyte hard drives.   Total space on 16-gigabyte hard drives.

192	32

A ← Total space on computer.
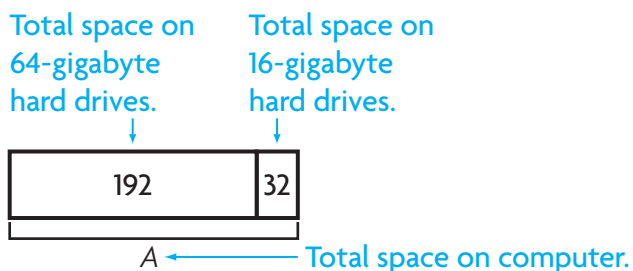
$192 + 32 = A$

_____ $= A$

STEP 4 The files use 78 gigabytes of space. Find how much hard drive space the computer has left.

space left   space used

y	78

224 ← Total hard drive space on the computer.
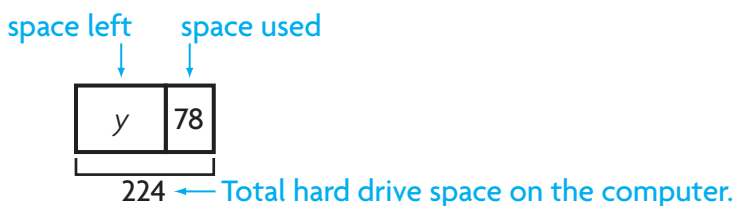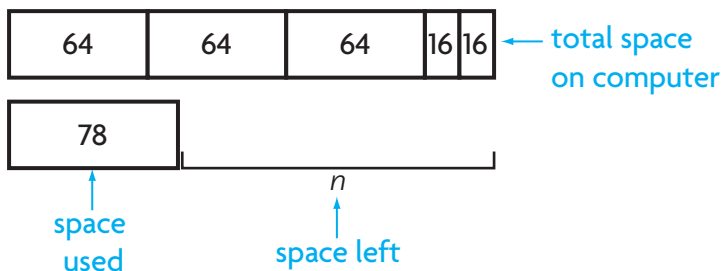
$224 - 78 = y$

_____ $= y$

So, Crismari has _____ gigabytes of hard drive space left on her computer.

Order of Operations The Order of Operations is a special set of rules that gives the order in which calculations are done in an expression. First, multiply and divide from left to right. Then, add and subtract from left to right.

🔒 Another Way Use one multistep equation.

| 64 | 64 | 64 | 16 | 16 | ← total space on computer |

| 78 |

↑ space used

↑ space left (n)

$$3 \times 64 + 2 \times 16 - 78 = n$$

$$\underline{\hphantom{XX}} + \underline{\hphantom{XX}} \times \underline{\hphantom{XX}} - \underline{\hphantom{XX}} = n$$

$$\underline{\hphantom{XX}} + \underline{\hphantom{XX}} - \underline{\hphantom{XX}} = n$$

$$\underline{\hphantom{XX}} - \underline{\hphantom{XX}} = n$$

$$\underline{\hphantom{XX}} = n$$

Share and Show MATH BOARD

1. Use the order of operations to find the value of n.

$$5 \times 17 + 5 \times 20 - 32 = n$$

$$\underline{\hphantom{XX}} + \underline{\hphantom{XX}} \times \underline{\hphantom{XX}} - \underline{\hphantom{XX}} = n$$ ← First, multiply 5×17.

$$\underline{\hphantom{XX}} + \underline{\hphantom{XX}} - \underline{\hphantom{XX}} = n$$ ← Next, multiply 5×20.

$$\underline{\hphantom{XX}} - \underline{\hphantom{XX}} = n$$ ← Then, add the two products.

$$\underline{\hphantom{XX}} = n$$ ← Finally, subtract to find n.

Find the value of n.

2. $3 \times 22 + 7 \times 41 - 24 = n$

$$\underline{\hphantom{XX}} = n$$

✅ 3. $4 \times 34 + 6 \times 40 - 66 = n$

$$\underline{\hphantom{XX}} = n$$

4. $2 \times 62 + 8 \times 22 - 53 = n$

$$\underline{\hphantom{XX}} = n$$

✅ 5. $6 \times 13 + 9 \times 34 - 22 = n$

$$\underline{\hphantom{XX}} = n$$

Math Talk

MATHEMATICAL PRACTICES ②

Use Reasoning If you solve $6 \times 3 + 2$ by adding before multiplying, will you get the same answer? Explain.

132

Name _____

Find the value of *n*.

6. $8 \times 42 + 3 \times 59 - 62 = n$

_____ $= n$

7. $6 \times 27 + 2 \times 47 - 83 = n$

_____ $= n$

Problem Solving • Applications Real World

8. **GO DEEPER** Maggie has 3 binders with 25 stamps in each binder. She has 5 binders with 24 baseball cards in each binder. If she gives 35 stamps to a friend, how many stamps and cards does she have left?

_____

WRITE ▶ *Math*
Show Your Work

9. **MATHEMATICAL PRACTICE ①** **Evaluate** Maddox has 4 boxes with 32 marbles in each box. He has 7 boxes with 18 shells in each box. If he gets 20 marbles from a friend, how many marbles and shells does he have?
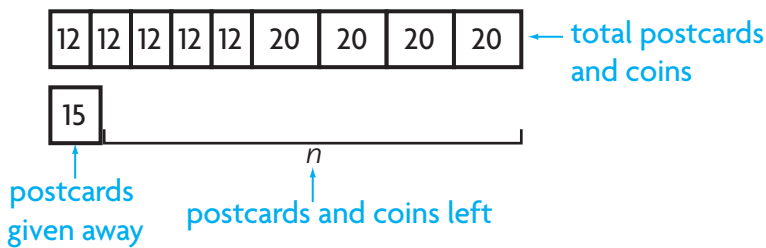
_____

Personal Math Trainer

10. **THINK SMARTER +** The soccer team sells 54 bagels with cream cheese for $2 each and 36 muffins for $1 each during a bake sale. The coach uses the money to buy socks for the 14 players. The socks cost $6 per pair. How much money does the coach have left? Explain how you found your answer.

_____

_____

_____

_____

_____

11. **THINK SMARTER** **What's the Error?** Dominic has 5 books with 12 postcards in each book. He has 4 boxes with 20 coins in each box. If he gives 15 post cards to a friend, how many postcards and coins does he have?

Dominic drew this model.

| 12 | 12 | 12 | 12 | 12 | 20 | 20 | 20 | 20 | ← total postcards and coins

| 15 |
               n

postcards given away

postcards and coins left

Dominic used these steps to solve.

$5 \times 12 + 4 \times 20 - 15 = n$

$60 + 4 \times 20 - 15 = n$

$64 \times 20 - 15 = n$

$1{,}280 - 15 = n$

$1{,}265 = n$

Look at the steps Dominic used to solve this problem. Find and describe his error.

_____

_____

Use the correct steps to solve the problem.

_____

_____

_____

_____

_____

So, there are _____ postcards and coins left.

Solve Multistep Problems Using Equations

Find the value of *n*.

1. $4 \times 27 + 5 \times 34 - 94 = n$

$108 + 5 \times 34 - 94 = n$

$108 + 170 - 94 = n$

$278 - 94 = n$

$184 = n$

2. $7 \times 38 + 3 \times 45 - 56 = n$

_____ $= n$

3. $6 \times 21 + 7 \times 29 - 83 = n$

_____ $= n$

4. $9 \times 19 + 2 \times 57 - 75 = n$

_____ $= n$

Problem Solving ⋅ Real World

5. A bakery has 4 trays with 16 muffins on each tray. The bakery has 3 trays of cupcakes with 24 cupcakes on each tray. If 15 cupcakes are sold, how many muffins and cupcakes are left?

_____

6. Katy bought 5 packages of stickers with 25 stickers in each package. She also bought 3 boxes of markers with 12 markers in each box. If she receives 8 stickers from a friend, how many stickers and markers does Katy have now?

_____

7. **WRITE** ▸*Math* Write a word problem that could be solved by writing and solving a multistep equation. Then solve your problem.

_____

_____

_____

Lesson Check

1. What is the value of n?

$$9 \times 23 + 3 \times 39 - 28 = n$$

2. What is the value of n?

$$4 \times 28 + 6 \times 17 - 15 = n$$

Spiral Review

3. Write an expression that shows how you can multiply 9×475 using expanded form and the Distributive Property.

4. Write an equation that represents this comparison sentence.

32 is 8 times as many as 4

5. Between which pair of numbers is the exact product of 379 and 8?

6. Write an expression that shows how to use the halving and doubling strategy to find 28×50.

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