

Name:

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## Solving Equations - Guided Practice

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- When solving an equation, \_\_\_\_\_ must be maintained. That is to say, whatever is done to one side of an equation, must be done to the \_\_\_\_\_.
- For example:  
The equation  $45 = 30 + 15$  states that the quantities 45 and  $30 + 15$  are equal.  
What do you have to do to maintain equality if you...
  - subtract 15 from the left-hand side of the equation?
  - add 10 to the right-hand side of the original equation?
  - divide the left-hand side of the original equation by 5?
  - multiply the right-hand side of the original equation by 2?

In the ancient Kingdom of Milford, the ambassadors carry diplomatic pouches. The contents of the pouches are unknown except by the ambassadors. Ambassador Lindberg wants to send one-dollar gold coins to another country.



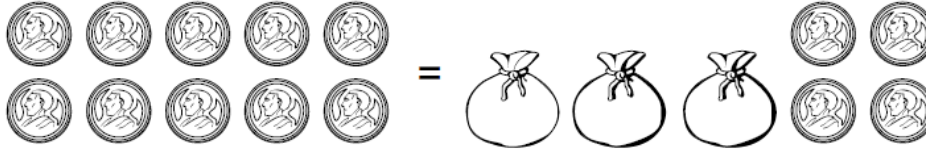
His daughter, Alexis, is a mathematician. She helps him devise a plan based on equality to keep track of the number of one-dollar gold coins in each pouch.

- In each situation:
  - Each pouch contains the same number of one-dollar gold coins.



- The number of gold coins on both sides of the equality sign is the same, but some coins are hidden in the pouches.

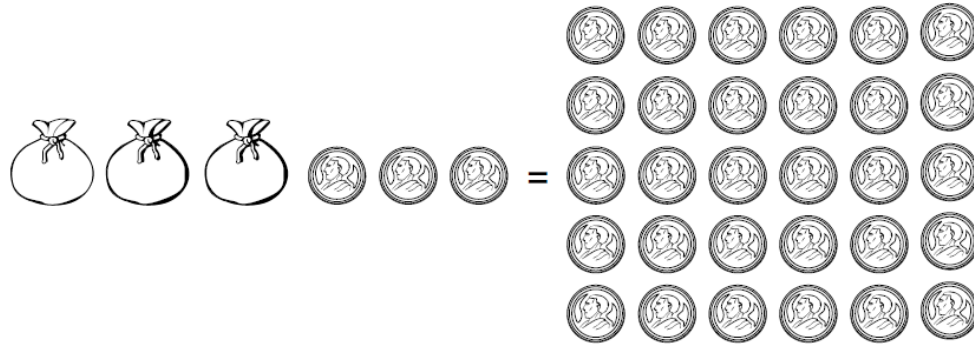
1. Alexis draws the following picture. Each pouch contains the same number of \$1 gold coins.



How many gold coins are in each pouch? Show your thinking.

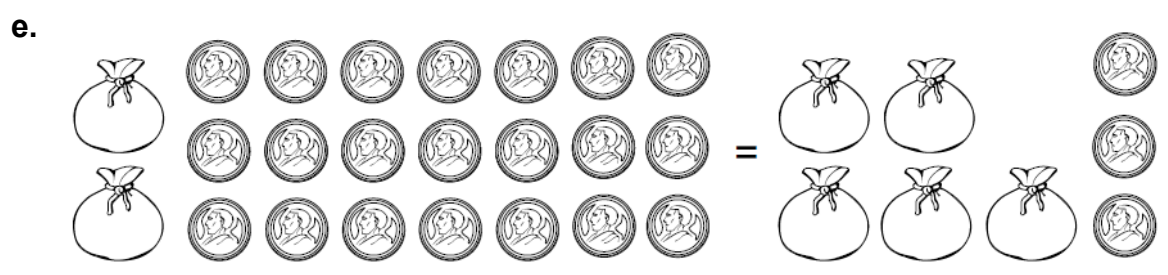
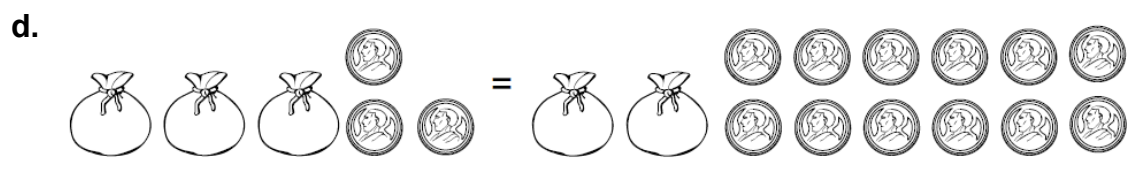
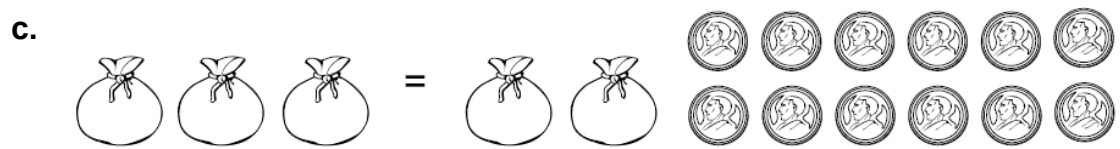
2. For each situation, find the number of gold coins in the pouch. Write down your steps so that someone else could follow your steps to find the same number of coins in a pouch.

a.



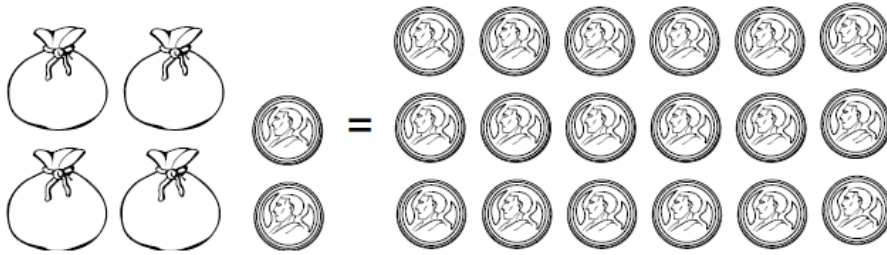
b.





3. Describe how you can check your answer. That is, how do you know you found the correct number of gold coins in each pouch?

4. The picture below represents another diplomatic pouch situation.



Because the number of gold coins in each pouch is unknown, we can let  $x$  represent the number of coins in one pouch and 1 represent the value of one gold coin.

Write an equation to represent this situation and solve it.

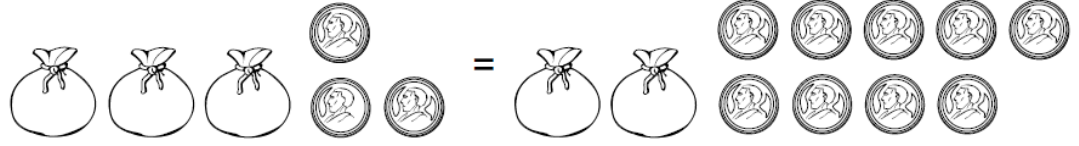
5. For each situation:

- Represent the situation with an equation. Use an  $x$  to represent the number of gold coins in each pouch and a number to represent the number of coins on each side.
- Use the equation to find the number of gold coins in each pouch.

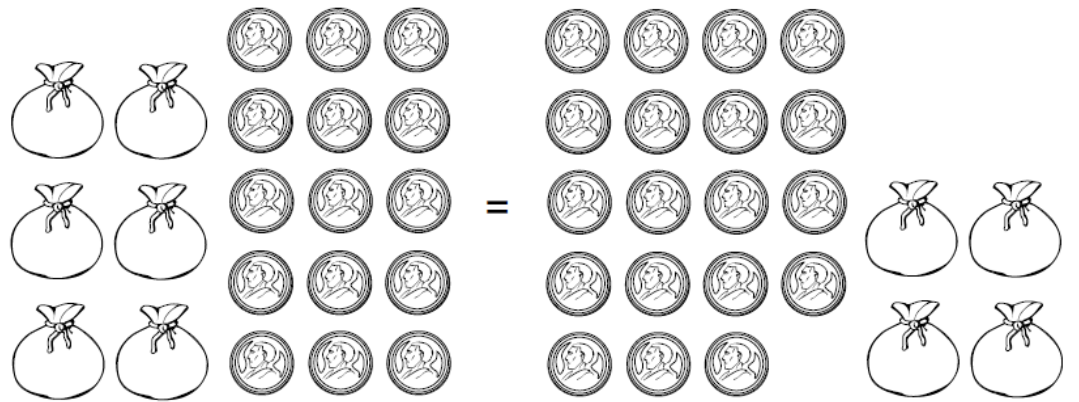
a.



b.



c.



6. Solve each of the equations below. Show your work!

a.  $5x + 10 = 20$

b.  $5x - 10 = 20$

c.  $5x + 10 = -20$

d.  $5x - 10 = -20$

e.  $10 - 5x = 20$

f.  $10 - 5x = -20$

