

Eye on the Prize**Lesson C3: Eye on the Prize****Warm Up**

Below is a Which One Does Not Belong problem. You use cognitive flexibility every time you think about one of these.

$x - 1$	$3(x + 2)$
x^2	$4 - 2y$

1. a) For each expression in this 2-by-2 square, explain why each does not belong.

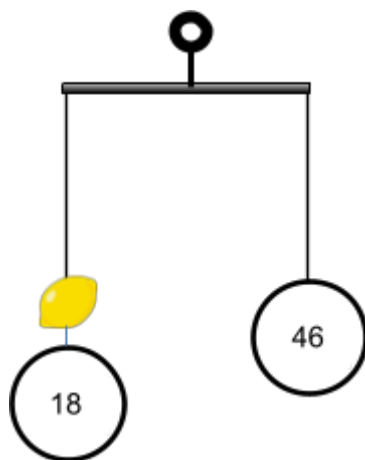
Hint: How is one expression different from the other three expressions?

- b) As you looked at each expression, how did you look at the other three expressions in different ways?

Keep thinking about how you are using your brain – like juggling, autopilot, pivoting -- to help you see math problems in different ways.

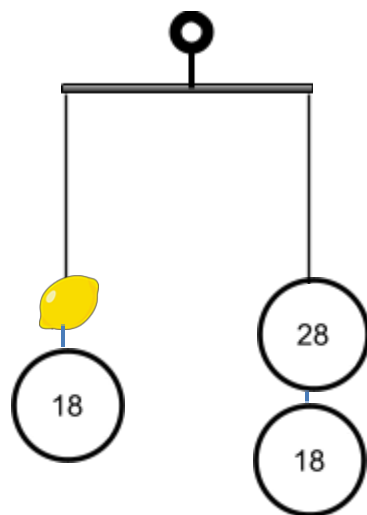
Example

For the hanger model and its code, describe what happens in each step.

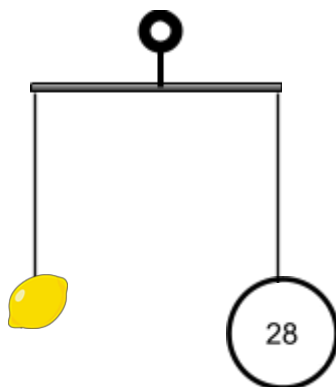


$$L + 18 = 46$$

Initial set up



$$L + 18 = 28 + 18$$



$$L = 28$$

For the hanger models, it is easier to see when the objects on both sides are equal (equations).

In the example, you found L by removing (or subtracting) the same thing from both sides. Since the variable L was connected to other values by addition, we used the **inverse operation** – subtraction – to remove the same thing from both sides.

Inverse operations undo each other. For example, if I add $12 + 7$ to get 19, I can subtract 7 from 19 to get back to my original number, 12.

Knowing inverse operations are the key to solving hanger models and equations.

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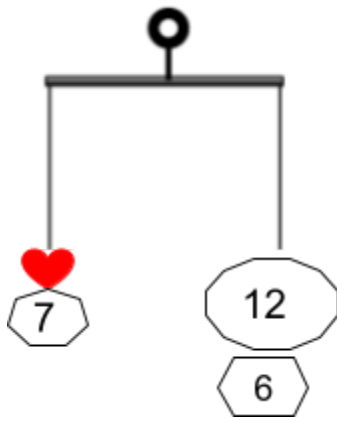
Inverse operations undo each other.

Addition and subtraction are inverse operations.

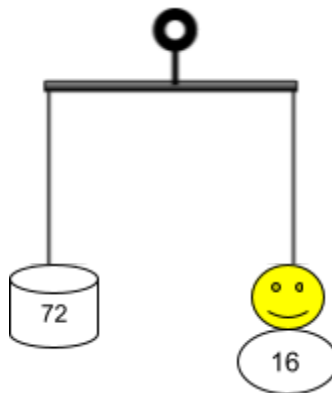
Multiplication and division are inverse operations.

Hanger Practice

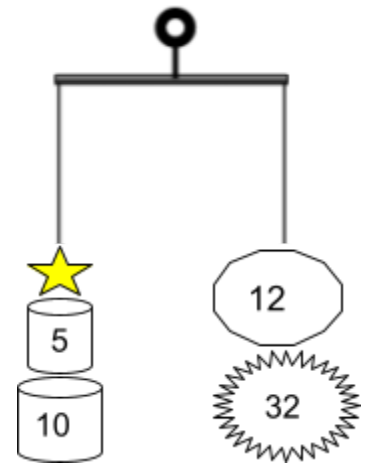
2.



3.



4.



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We can solve many types of codes that are equations by using inverse operations.

5. Look at the following codes in the table below.
- Identify the operation that connects the variable with a number.
 - What is the inverse operation you would use to solve each code?
- (The first example is completed for you already.)

Code	Operation connecting variable to a number	Inverse operation used to solve code	Solution
i) $12a = 60$	Multiply a and 12	Divide by 12	$a = \underline{\quad}$
ii) $100 = b + 25$			
iii) $c \div 5 = 2$			
iv) $13 = d - 12$			
v) $15 = 3e$			
vi) $10 = f \div 20$			

You can check your solutions by substituting your answers back into the original equation and seeing if the equality holds.

See the equation: $6+x=10$

The 6 is attached by addition, the inverse of addition is subtraction.

Subtract both sides by 6 and see $x=4$.

Take 4 and substitute it into the original equation $6+(4)=10$

See $10=10$ so the solution keeps the equation balanced.

Code	Solution	Check
i) $12a = 60$	$a = \underline{\hspace{1cm}}$	
ii) $100 = b + 25$		
iii) $c \div 5 = 2$		
iv) $13 = d - 12$		
v) $15 = 3e$		
vi) $10 = f \div 20$		

6. Write a summary of how you would find the value of the variable with a

a) hanger model

b) code



7. Describe the pros and cons of using each method to find the value of a variable.

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Summary

Inverse operations undo each other. You can do this algebraically or on the hanger model. See the chart below to recall which operations are inverses of each other.

Inverse operations undo each other.

Addition and subtraction are inverse operations.

Multiplication and division are inverse operations.

You can check your solutions by substituting them back into the original equation and simplifying.