PRIME ma+hgazine

Sockeroo

Todd throws his socks into a drawer without matching pairs. And, when there is a hole in a sock, he tosses the bad sock and keeps the other one in his drawer. He knows that there are 4 gray socks, 3 tan socks, and 2 blue socks in the drawer.

Without looking at the colors:

1. What are the chances that Todd will pull out 2 gray socks? _____

2. What are the chances that Todd will pull out a pair of matching socks? _____

Larry's Birthday Party

Larry and his seven friends: Ben, Cindy, Jason, Mary, Rob, Sue, and Tina, were at the birthday party. Use the clues to fill in the names of people seated at the table.

Clues
- Larry is seated between Mary and Jason.
- Jason is to the right of Cindy.
- Mary is to the left of Ben.
- Ben is alone on his side of the table and opposite Cindy.
- Cindy is to the right of Tina.
- If everyone moved one seat to the left, Rob would be opposite Jason, and both would be alone on the ends of the table.

MATHgazine Editors

Carole Greenes Ed. D.
   carole.greenes@asu.edu
Jason Luc
   jason.luc@asu.edu
Yifan Tian
   ytian46@asu.edu
Larry Yong
   pyong1@asu.edu

Dangerous Debt

On August 1, 2016, at 6 pm,
The U.S. debt was about $19,411,039,000,000.

1. One-dollar bills, equal in value to the U.S. debt, are piled one on top of the other. What is the height of the pile of ones to the nearest mile?

   _____miles

2. Laid end-to-end, what is the length of the national debt in $100 dollar bills? _____miles

3. The U.S. population in 2016 is 324,118,789. If the debt is shared equally, how much would each person in the U.S. be responsible for? $_____

4. The weight of the U.S. debt in $5 bills is

   _____ kilograms.

> **U.S. Currency**
> $1, $5, $10, $20, $50, and $100 bills.
> **Dimensions:**
> Length: 6.14 in.
> Width: 2.61 in.
> Thickness: 0.0043 in.
> Weight: 19 grams

Remarkable Relationship

$1^3 = 1$, or 1^2

$1^3 + 2^3 = 9$, or $(1 + 2)^2 = 3^2$

$1^3 + 2^3 + 3^3 = 36$, or $(1 + 2 + 3)^2$, or 6^2

Complete these problems.
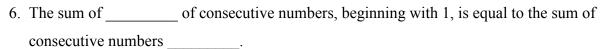Identify the remarkable relationship. Complete the sentence in #6.
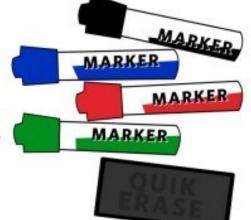
1. $1^3 + 2^3 + 3^3 + 4^3 =$ _____, or _____^{2}

2. $1^3 + 2^3 + 3^3 + 4^3 + 5^3 =$ _____, or _____^{2}

3. $1^3 + 2^3 + 3^3 + 4^3 + 5^3 + 6^3 =$ _____, or _____^{2}
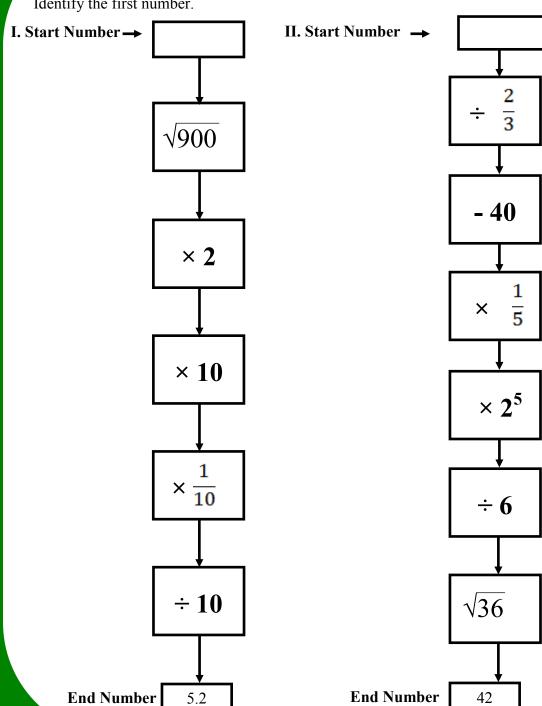
4. $1^3 + 2^3 + 3^3 + 4^3 + 5^3 + 6^3 + 7^3 =$ _____, or _____^{2}

5. $1^3 + 2^3 + 3^3 + 4^3 + 5^3 + 6^3 + 7^3 + 8^3 =$ _____, or _____^{2}

6. The sum of _____ of consecutive numbers, beginning with 1, is equal to the sum of consecutive numbers _____.

Back Up
Identify the first number.

I. Start Number → [ ]

$\sqrt{900}$

× 2

× 10

$\times \dfrac{1}{10}$

÷ 10

End Number | 5.2

II. Start Number → [ ]

$\div \dfrac{2}{3}$

- 40

$\times \dfrac{1}{5}$

$\times 2^5$

÷ 6

$\sqrt{36}$

End Number | 42

βαιΖαΝθς

Balzano is a puzzle that will tap into your logical reasoning abilities. Read directions carefully, then try your hand at Balzano Shapes.

Directions:

Your job is to figure out the Desired Arrangement (the solution) of three elements (shapes) from clues that provide information about the shapes and their locations. The possible shapes are **octagon, pentagon, rectangle, square,** and **triangle.** No shape may be repeated.

The **Arrangement Column** shows sets of shapes in rows. In the Balzano puzzle below, the second row, arranged in order from left to right, is: square, triangle, rectangle.

Correct Shape in the Correct Place identifies the number of elements that are the correct shape AND in the right place. The second row has no shapes in the right place.

Correct Shape in the Wrong Place identifies the number of correct shapes BUT in the wrong place. The second row has one correct shape in the wrong place.

Incorrect Shape identifies the number of shapes that do not belong in the arrangement. There are two of these in the second row.

	Correct Shape/ Correct Place	Correct Shape/ Wrong Place	Wrong Shape/ Wrong Place
△ ◯ ⬠	1	1	1
▢ △ ▭	0	1	2
▭ ▢ ⬠	0	2	1
▭ △ ▢	1	0	2
	3	0	0