PRIME ma+h gazine Senior!

Coin Collections

Type of Coin	Penny	Nickel	Quarter
Weight	2.50 g	5.00 g	5.67 g
Thickness	1.55 mm	1.95 mm	1.75 mm

1. 1 kilogram of pennies are worth $_____.
2. _____ kilograms of pennies is equal in mass to 2 kilograms of nickels.
3. A stack of nickels worth $80 has a mass of _____ kilograms and a height that is _____ meters.
4. One kilogram of quarters, to the nearest whole number, is _____ quarters, and has a total value of $_____.
5. The distance from Phoenix to Sedona is 187 kilometers. Imagine coins of the same type stacked to be equal in length to that distance.
   a. What is the value of the stack of pennies? _____
   b. Which is greater in value, a stack of nickels or a stack of pennies? _____
      How much greater? _____
   c. How much greater in value is a stack of quarters than a stack of nickels? _____

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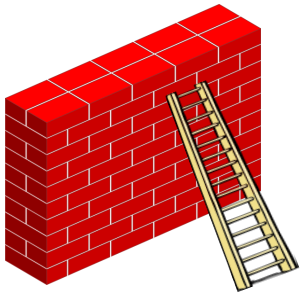
Don't Fall

To paint tall buildings, painters need tall ladders. To decide on the height of a ladder, painters have to take into consideration where the base at the ladder is placed, that is the distance from the wall, so that the ladder won't tip over.

1. Jeff Sloan has to paint a wall that is about 6.5 meters high. He wants to buy a ladder so that he can put the base of the ladder 2 meters from the wall to ensure that it won't tip over. How tall should the ladder be? Note: Stores sell ladders that measure in whole numbers of meters. _____

2. Jeff owns a 4 meter ladder. He sets it up at a distance of 2 meters from the wall. The top of the ladder touches the wall at point A. To the nearest tenth, how many meters above the floor is point A? _____



Unknown!

Same shapes are same numbers. Row and Column sums are in circles.

Row \ Column	1	2	3	
1	□	⏢	X	21
2	□	Z	⏢	23
3	⏢	X	△	19
4	Y	□	△	23
	35	27	24	

□ = _____ X = _____

⏢ = _____ Y = _____

△ = _____ Z = _____

Expensive Movies

Use the clues to complete the story about movie production costs.
Costs have been adjusted by inflation.

The most expensive movie ever made was *Pirates of the Caribbean: On Stranger Tides,* released in _____ (A). The production cost was about _____ (B) million dollars. Four years earlier, in _____ (C), *Pirates of the Caribbean: At World's End* was produced. Its production cost was _____ (D) million dollars. Although this older Pirates movie cost less to produce, its box office receipts were the greatest of all movies.

The movie grossed more than _____ (E) million dollars. *Tangled,* the Disney movie about Rapunzel, is the most expensive animated film ever made. It took _____ (F) years to produce and was released in _____ (G). The cost of producing the film was _____ (H) million dollars. Box office receipts were almost _____ (I) million dollars.

Clues

A. 21st century year. Sum of the digits is 4.
The tens and ones digits are the same.

B. The ones digit is 2^3.
The hundreds digit is $\frac{1}{3}$ the tens digit.
$300 < B < 400$

C. 21st century year.
The ones digit is the greatest single-digit prime number.
Sum of the digits is 9.

D. Even 3-digit number.
Sum of the digits is 9.
The hundreds digit is one less than the tens digit.
The tens digit is twice the ones digit.

E. Three-digit number.
The tens digit is a perfect number.
The hundreds digit is 3^2.
Sum of the digits is 18.

F. Perfect number < 10

G. 21st century even-numbered year.
Digits sum to 3.

H. Three-digit number.
All digits are powers of 2.
Only the hundreds and ones digits are the same.
Sum of the digits is 12.

I. 37×2^4

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

Directions:

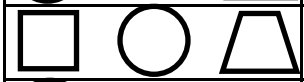
Your job is to figure out the Desired Arrangement (the solution) of three elements (shapes) from clues that provide information about the shapes and their locations. The possible shapes are Circle, Pentagon, Square, Trapezoid, and Triangle**.** No shape may be repeated.

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: trapezoid, circle, pentagon.

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 one shape in the right place.

Correct Shape in the Wrong Place identifies the number of correct shapes BUT in the wrong place. There are none of these in the second row.

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
	0	1	2
	1	0	2
	0	2	1
	1	1	1
	1	1	1
	1	0	2
	3	0	0

