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#Jenny



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Cool! I'am really happy

#Markus Jensen



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so many fake sites. this is the first one which worked! Many thanks

Problems

1. Find all 3-digit numbers \overline{abc} such that $\overline{ab} + \overline{bc} = \overline{ac}$. Note: In problems like this, a, b, c are digits, i.e., $0 \leq a, b, c \leq 9$ and we do not allow leading zeros.
2. Evaluate:
$$a = (128 - 2)(128 - 2^2)(128 - 2^3) \dots (128 - 2^7)(128 - 2^7)$$
3. Show that $(2^{20} + 3^{20}) + (2^{20} - 3^{20})$ is a perfect square.
4. I am 30 years older than my daughter. If I were 2 times younger than I really am and she was 8 years older than she really is, we would be the same age. How old are we?
5. Find all numbers of the form \overline{xyz} that are divisible by 11, 12, and 13.
6. Prove that
$$149673 + 456781 + 567814 + 678145 + 781456 + 814567$$
is the product of six different prime numbers.
7. Find the last digit of $2^{2^{2^{\dots}}}$.
8. Find the number of zeros in which 50! ends.
9. The average cost of a long-distance call in 1983 was 41 cents per minute, and the average cost of a long-distance call in 2005 was 7 cents per minute. Find the approximate percent decrease in the cost per minute of a long-distance call.
10. An athlete's target heart rate, in beats per minute, is 80% of the theoretical maximum heart rate. The maximum heart rate is found by subtracting the athlete's age, in years, from 208. To the nearest whole number, what is the target heart rate of an athlete who is 26 years old? (top)
11. Miki has a dozen oranges of the same size and a dozen pears of the same size. Miki can extract 8 ounces of pear juice from 3 pears and 8 ounces of orange juice from 2 oranges. She makes a pear-orange juice blend from an equal number of pears and oranges. What percent of the blend is pear juice?
12. If x and y are non-zero numbers such that x is $p\%$ of y and y is $q\%$ of x , find p ?
13. Evaluate
$$100^2 - 99^2 + 98^2 - 97^2 + \dots + 2^2 - 1^2$$
14. A polygon has six times as many diagonals as it has sides. How many vertices does the polygon have?
15. In Plano, there were 777 people who voted. There were 10% more female voters than male voters. How many female voters were there?
16. (a) Find the greatest prime p such that p^2 divides $90! + 91!$
(b) Find the second greatest prime with this property.
17. What is the remainder when $1! + 2! + 3! + \dots + 10!$ is divided by 100?

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