UNIVERSITY OF WATERLOO
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Centre for Education in
Mathematics and Computing

Grade 6 Math Circles

Winter 2019—April 2 & 3

Jeopardy

Questions:

Counting:

\$100: How many ways are there to arrange six items, WITH repetition?

\$200: How many ways are there to arrange six items, WITHOUT repetition?

\$300: How many groups of four people can you make from a group of eight people when order matters?

\$400: How many ways are there to arrange four people from a group of eight when order DOES NOT matter?

\$500: If Frodo, Sam, Aragorn, Legolas, Gimli, Merry, Pippin, Gandalf, and Boromir are all waking to Mordor single-file and Merry and Pippin want to walk together, how many different walking arrangements are there?

Exponents (calculators were not permitted for this category):

\$100: What is 5^5?

\$200: What is 2^{-10}?

\$300: What is $3^3 \times 3^4$?

\$400: What is $(4^3)^2$

\$500: What is $\left((2^{-2})^{\frac{1}{2}}\right)^{-1}$?

Platonic Solids:

\$100: How many sides does a dodecagon have?

\$200: How many sides does an icosahedron have?

\$300: What is the higher-dimensional equivalent of a face?

\$400: How many cells does a hypercube have?

\$500: How many vertices does a hypercube have?

Arithmetic Tricks (calculators were not permitted for this category):

\$100: What is 58×11?

\$200: What is 47×99?

\$300: What is 6157×5?

\$400: What is 999×85?

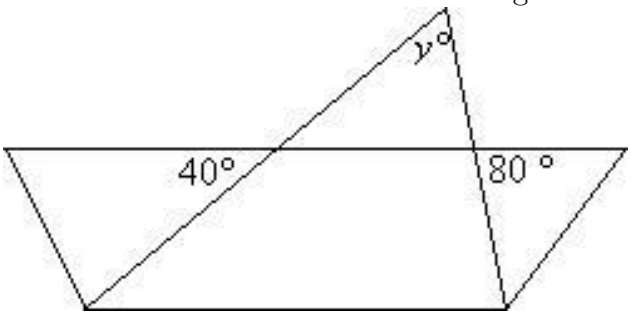
\$500: What is 53×67?

Angles:

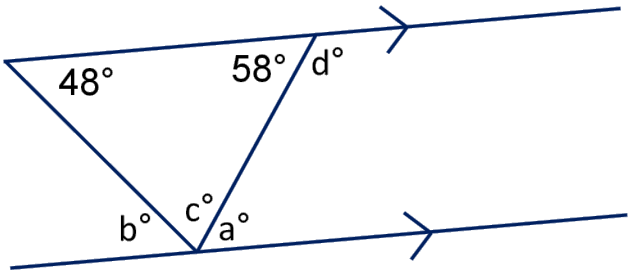
\$100: What is a reflex angle?

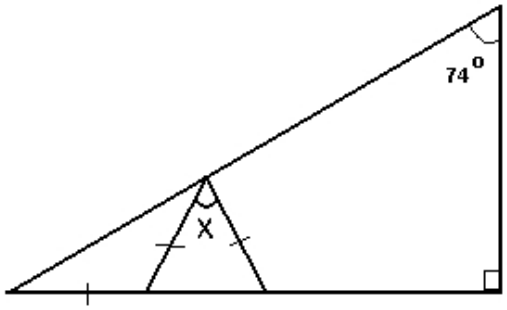
\$200: Two angles add to 90°. What do we call those angles?

\$300: Solve for y:



\$400: Solve for all angles. (a, b, c, and d)





\$500: Solve for x above.

Units and Dimensions:

\$100: If force is typically measured in Newtons $\left(\frac{kg \times m}{s^2}\right)$, what are the dimensions of force?

\$200: What are four of the seven fundamental dimensions?

$300: Ten hectometres is how many decimetres?

$400: One megacandela is how many nanocandela?

$500: If the universe is 13.7 billion years old, how old is it in seconds?