



Grade 7/8 Math Circles
Winter 2015 - March 3/4
Jeopardy and Gauss Prep

Jeopardy

Arithmetic

\$100. What is 4m^3 in mm?

\$200. What is 29×21 ?

\$300. If the tax rate is 12.5% and Johnny wants to buy a pair of shoes for \$120, approximately how much will he have to pay?

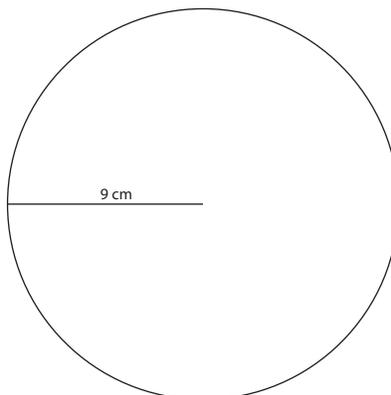
\$400. What is 205^2 ?

\$500. Is 51515101 divisible by 11?

Pi

\$100. Find r if $d = 14$.

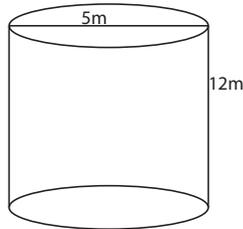
\$200. Find the area of the circle.



\$300. Find r if $C = 14\pi$ cm.

\$400. Find the approximate area of a regular octagon.

\$500. What is the surface area of this cylinder?



Number Theory

\$100. What is the 10^{th} prime number?

\$200. Find the prime factorization of 174.

\$300. Find the GCD of 49 and 693.

\$400. Find the LCM of 25 and 9.

\$500. The sum of the 5 digits of a palindrome is 3 and their product is 0. What is the palindrome?

Kinematics

\$100. What is 4500 m/s in km/h?

\$200. Usain ran 100m in 9.69s. How fast was he going?

\$300. If I ran 42.195 km and Sachin walked for 3 hours at 4 m/s, who travelled farther?

\$400. Adric and Alain run a 5km race. Adric runs at 4m/s and Alain runs at 3m/s. If Alain gets a 7 minute lead, who wins the race?

\$500. Adric and Alain run a 5km race. Adric runs at 4m/s and Alain runs at 3m/s. If Alain gets a 7 minute lead, at what time are Adric and Alain in the same spot?

Random Questions

\$100. What is the 4th term in the sequence $n = n^2 + 1$?

\$200. What is the next term in the sequence $\{2, 4, 16, \dots\}$?

\$300. In a family of 6, everyone plays soccer or hockey. If 4 people play both sports and 1 person plays only hockey, how many play only soccer?

\$400. How many different types of cakes can I bake if I have 3 choices for cake mix, 3 choices for frosting and 2 choices for sprinkles (assuming I only want one of each choice)?

\$500. How many different ways can I arrange 4 friends to sit at the movies?

Gauss Prep

\$100. Ahmed is going to the store. One quarter of the way to the store, he stops to talk with Kee. He then continues for 12 km and reaches the store. How many kilometres does he travel altogether?

\$200. A six-sided die has the numbers one to six on its sides. What is the probability of rolling a five?

\$300. The length of each edge of a cube is 1 cm. What is the surface area of the cube, in cm^2 ?

\$400. A quiz has three questions, with each question worth one mark. If 20% of the students got 0 questions correct, 5% got 1 question correct, 40% got 2 questions correct, and 35% got all 3 questions correct, then what was the overall class mean (average) mark?

\$500. Chris lies on Fridays, Saturdays and Sundays, but he tells the truth on all other days. Mark lies on Tuesdays, Wednesdays and Thursdays, but he tells the truth on all other days. On what day of the week would they both say: "Tomorrow, I lie."?

Double Jeopardy

Types of Numbers

\$200. Which country created the concept of 0?

\$400. What does the y-axis represent on the complex plane?

\$600. Which sets of numbers does $\sqrt{7}$ belong to?

\$800. What is $\sqrt{-121}$?

\$1000. What is $(3i + 2) \times (4i - 5)$?

Number Theory

\$200. What is the 7th triangular number?

\$400. What is the multiplicity of the prime factorization of 64?

\$600. What is $\sqrt{1002001}$?

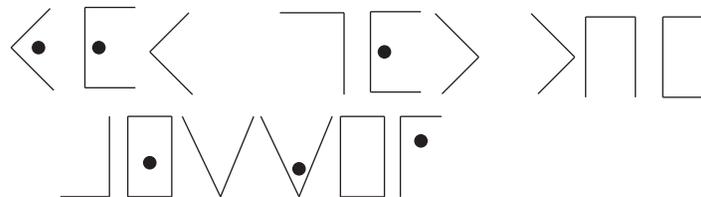
\$800. What is 100001^3 ?

\$1000. What is the next palindrome after 2002?

Cryptography

\$200. Encrypt the message "I WILL WIN" with a Caesar shift of 10.

\$400. Decrypt the following:



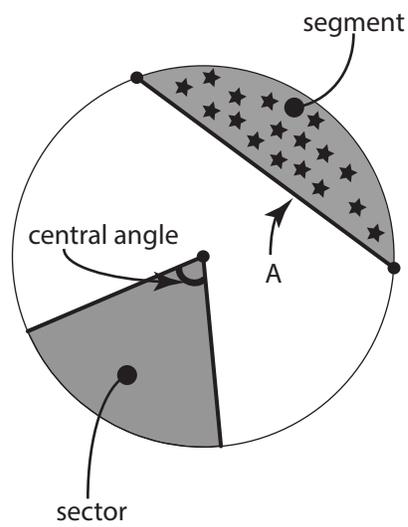
\$600. Decrypt "19210303051919 0120 12011920".

\$800. What is $496 \pmod{42}$?

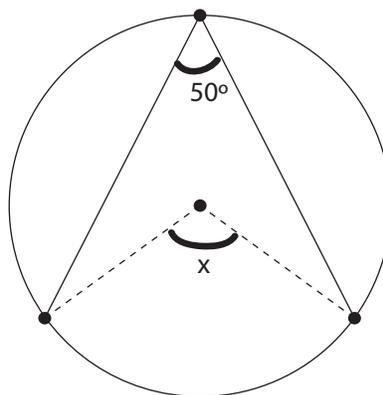
\$1000. Decrypt the shifted message with frequency analysis:

“NUNVNWCJAH VH MNJA FJCBXW”

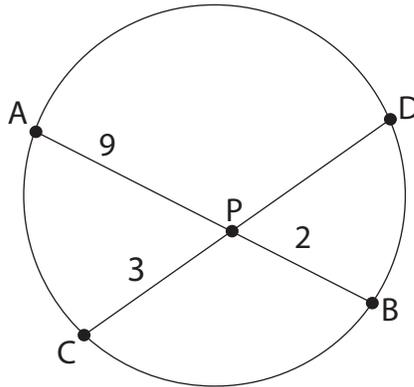
Circle Geometry \$200. What is the term for A?



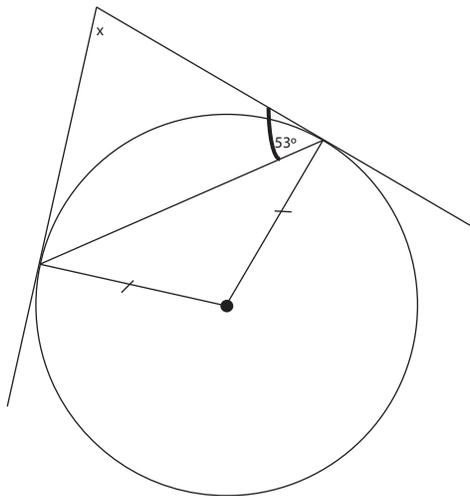
\$400. What is the measure of angle x?



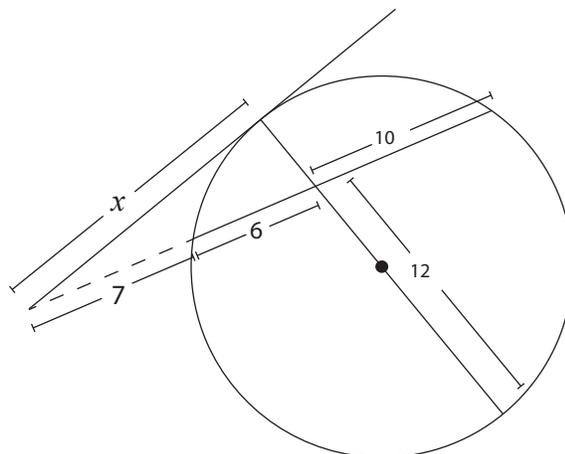
\$600. Find PD.



\$800. Find the measure of angle x .

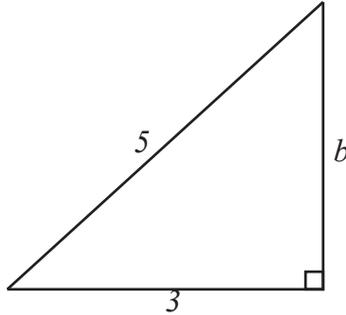


\$1000. Find the measure of x .

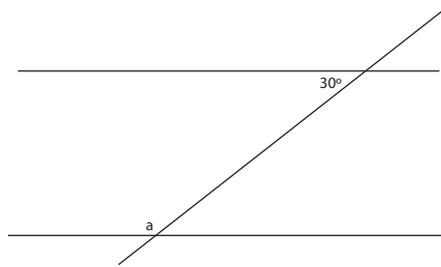


Random Questions

\$200. What is the measure of b ?



\$400. What is the measure of angle a ?



\$600. What is the better deal? 10 chocolates for \$40 or 6 chocolates for \$27?

\$800. Julian saves \$12 on a \$40 soccer ball. What is the discount?

\$1000. If there are 8 speed skaters in the Olympic final, how many possibilities are there for awarding gold, silver and bronze?

Gauss Prep

\$200. Five children had dinner. Chris ate more than Max. Brandon ate less than Kayla. Kayla ate less than Max but more than Tanya. Which child ate the second most?

\$400. What is the difference between the smallest three-digit palindrome and the largest three-digit palindrome?

\$600. In a class of 40 students, 18 said they liked apple pie, 15 said they liked chocolate cake and 12 said they did not like either. How many students in the class liked both?

\$800. Chuck the llama is tied to the corner of a 2 m by 3 m shed on a 3 m leash. How much area does Chuck have in which to play if he can go only around the outside of the shed?

\$1000. To shovel all of the snow on his driveway, Kevin needs 12 hours. Individually, Dave needs 8 hours to shovel all of Kevin's snow, John needs 6 hours to shovel all of Kevin's snow, and Allison needs 4 hours to shovel all of Kevin's snow. If Kevin, Dave, John, and Allison all work together, how many minutes do they need to shovel all of Kevin's snow?

Final Jeopardy

A 3×3 grid is filled with the digits 1, 2, and 3 so that each number appears once in each row and column. How many different ways are there of filling the grid?