π-Rates Spring 2024 Competition

Presented by the Board of the π-Rates Math Club

THIS SLIDE INTENTIONALLY LEFT BLANK

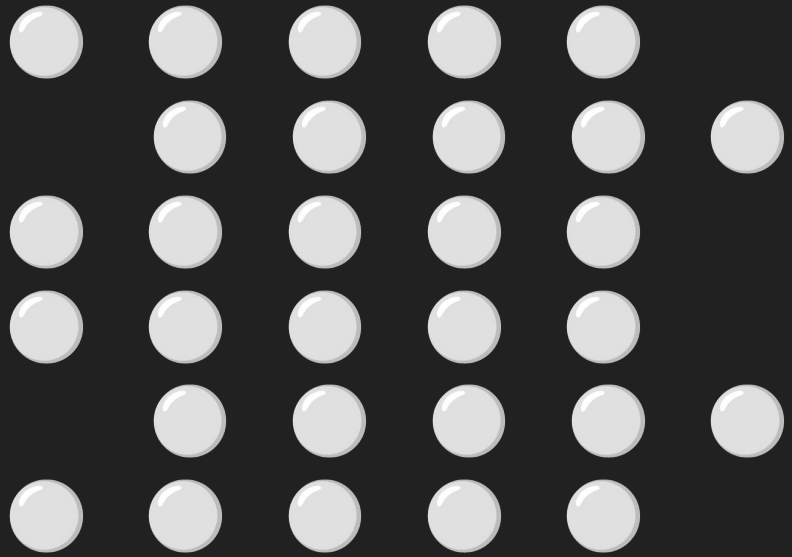
Problem 01

Evaluate

$4^2 \times 3^2$

Problem 02

How many dots are there?



Problem 03

What is the value of c?

Pythagorean Theorem: $a^2 + b^2 = c^2$

Problem 04

What is the value of y when x = 2?

$$4y = 2x - 4$$

Problem 05

If Mr. Speed runs at a constant rate of 30 miles per hour, how many miles will he travel in 4.5 hours?

Problem 06

Solve for the x-intercept of

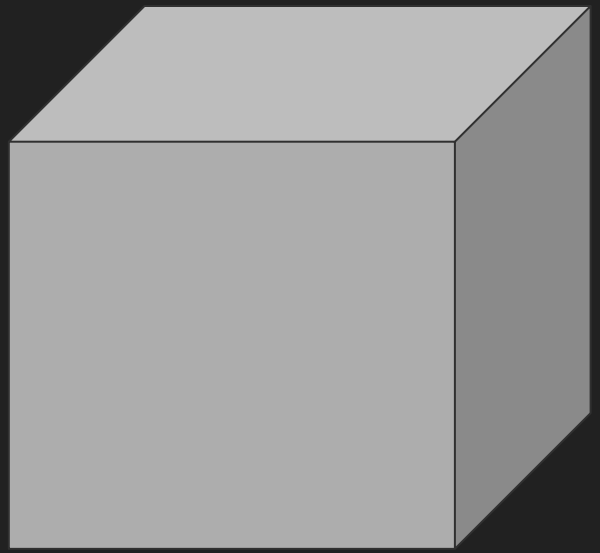
$$f(x) = (x-3)^2$$

Problem 07

Simplify (√9)^3

Problem 08

What is the surface area of the cube?



Problem 09

Write the following fraction as a mixed number:

$$\frac{37}{7}$$

Problem 10

The distance between the US and Brazil is about 4500 miles. The distance between Brazil and Haiti is about 2700 miles. If Haiti is between the US and Brazil, how many miles are between the US and Haiti?

Problem 11

What is $2^2 \times 2^2 \times 2^2$?

Problem 12

Evaluate

$(30 - 30) \times 30$

Problem 13

A graphing calculator costs $135. How much do I have to pay if I want to buy 3 calculators (ignoring tax)?

Problem 14

In the following function, as x approaches infinity, what does f(x) approach?

$$f(x) = -x$$

Problem 15

What is 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1?

Problem 16

There are 365 days in a year, which is (about) 52 weeks in a year. If there are 5 weekdays per week, how many weekdays are there in a year?

Problem 17

If Shawn pays $107 for a protein bar recommended by his physician, Dr. Make, and he buys 90 bars, how much will he have to pay?

Problem 18

26 students from NP3 apply to UC Santa Cruz. 12 are accepted into the university. 4 choose to enroll at UC Santa Cruz. What fraction of acceptees choose to enroll at UC Santa Cruz?

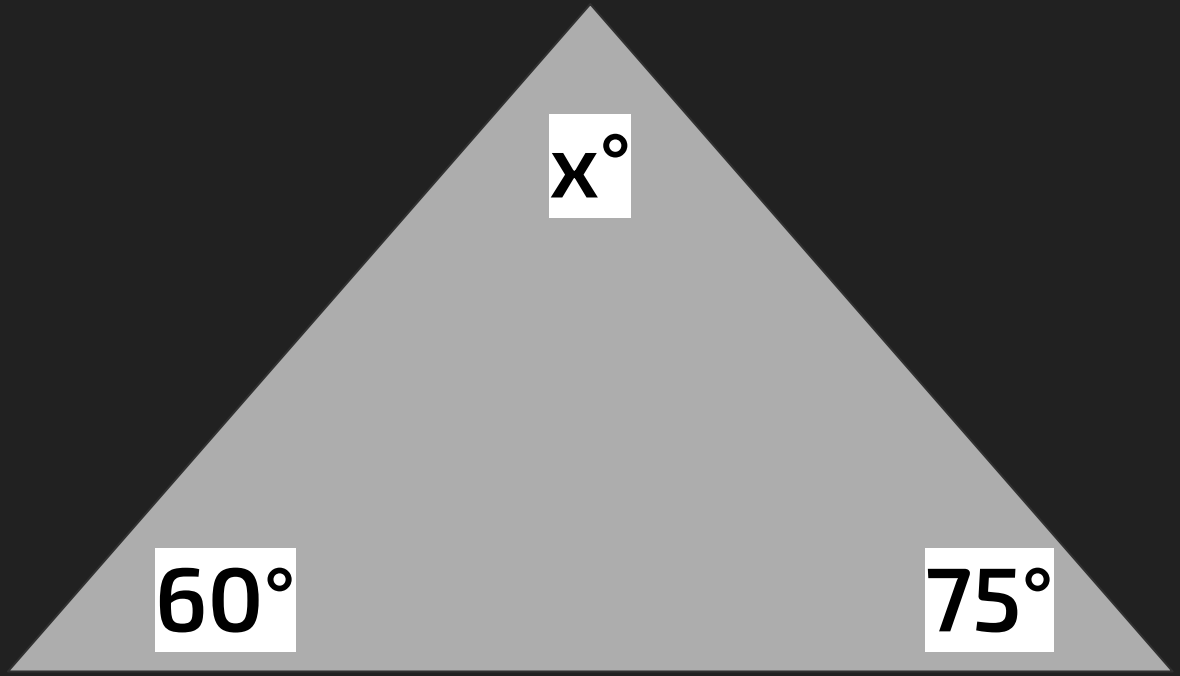
Problem 19

The ratio of t:j is 6:13

If j is 143, what is t?

Problem 20

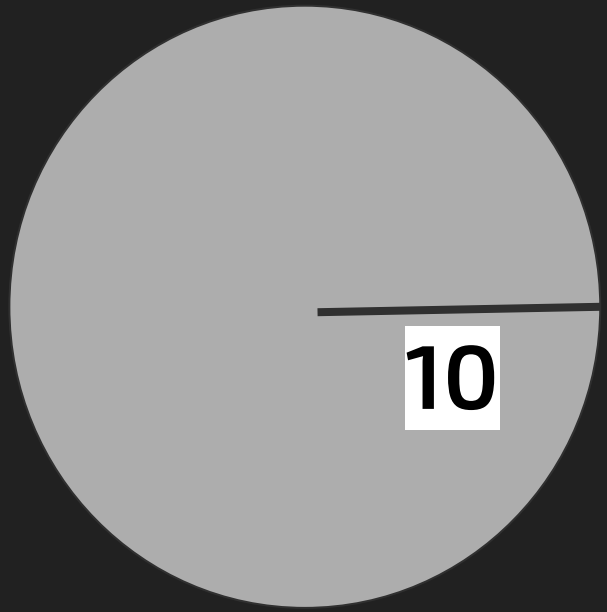
What is the value of x?



Interior angles of a triangle add to 180°

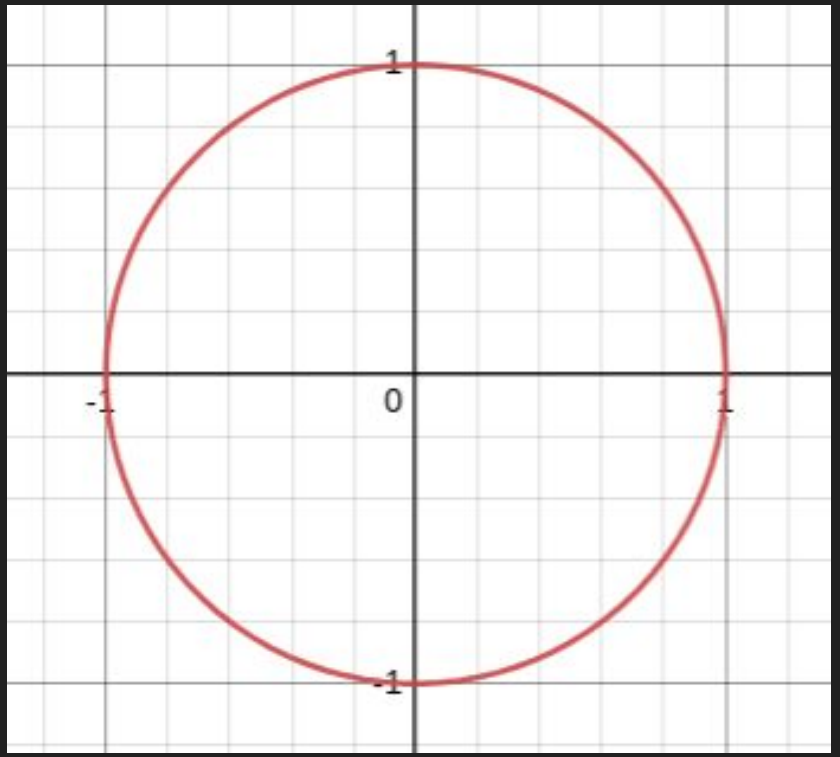
Problem 21

What is the area of the circle (in terms of π)?



Problem 22

How many times does the following equation intercept the y-axis?



Problem 23

Given that $5(5a + b) = 2$, what is the value of $10(5a + b)$?

Problem 24

Joseph T. takes a certain amount of AP classes. There are 38 total AP classes available and he chooses to take 1/2 of the AP classes. How many AP classes did Joseph take?

Problem 25

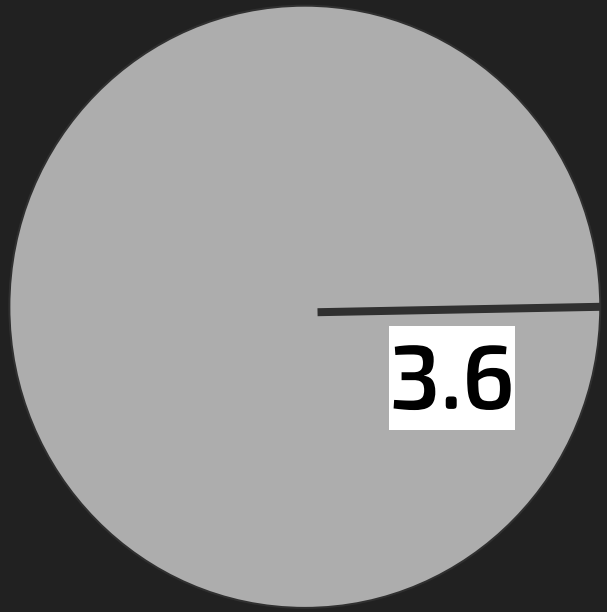
In a school, 20% of students study calculus and 80% study algebra. If there are 500 people in the school, how many more studied algebra than calculus?

Problem 26

How many vowels are on this screen(not including “y”)?

Problem 27

What is the circumference of the circle (in terms of π)?



Problem 28

Evaluate

$$2 \times (1 + 2 + 3 + 4 + 5)$$

Problem 29

If I have a square with a side length of 8, what is the perimeter of the square?

Problem 30

Evaluate

$2^2 + (5 - 3) \times 2 + 1$

Hint: Make sure to use the correct order of operations(PEMDAS)

Problem 31

I buy 11 shares of Google for $140 dollars each. How many dollars does my purchase cost in total, without tax?

Problem 32

Mr. R is 8 feet and 2 inches tall.
How tall is Mr. R in inches?

Problem 33

Find the (x,y) pair solution to the following systems of equations:

$$y = 10x - 3$$

$$y = -2x + 9$$

Problem 34

What is the y-intercept of the following function?

$$f(x) = 2^x + 4$$

Problem 35

Solve for the smallest solution of x

$$x^2 + 5x + 6 = 0$$

Problem 36

A printer can print 465 pages in 5 minutes. How many minutes will it take the printer to print 186 pages?

Problem 37

A container can store 35 liters of water. It is currently filled with 28 liters of water. What percent of the container is filled with water?

Problem 38

Evaluate

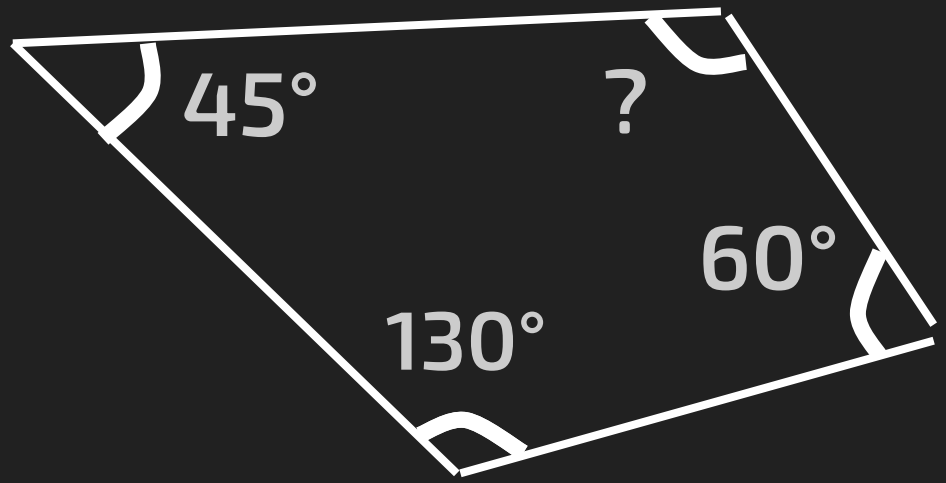
$$|3 \times 5 \times -2| + 1$$

Problem 39

What is the value of x?

Problem 40

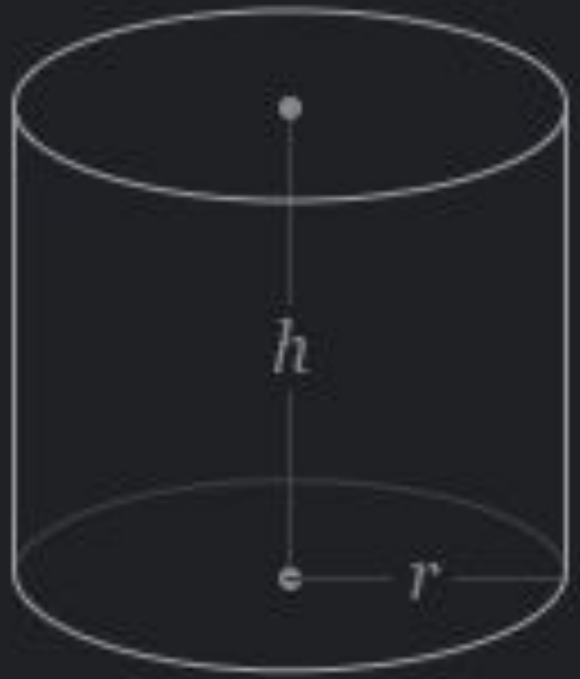
What is the measure of unknown angle?



Problem 41

If the volume of a cylinder is 45π and its height is 5, what is its radius?

Volume = $\pi r^2 h$



Problem 42

Find the mean of the data set:

3, 3, 5, 8, 9, 10, 11

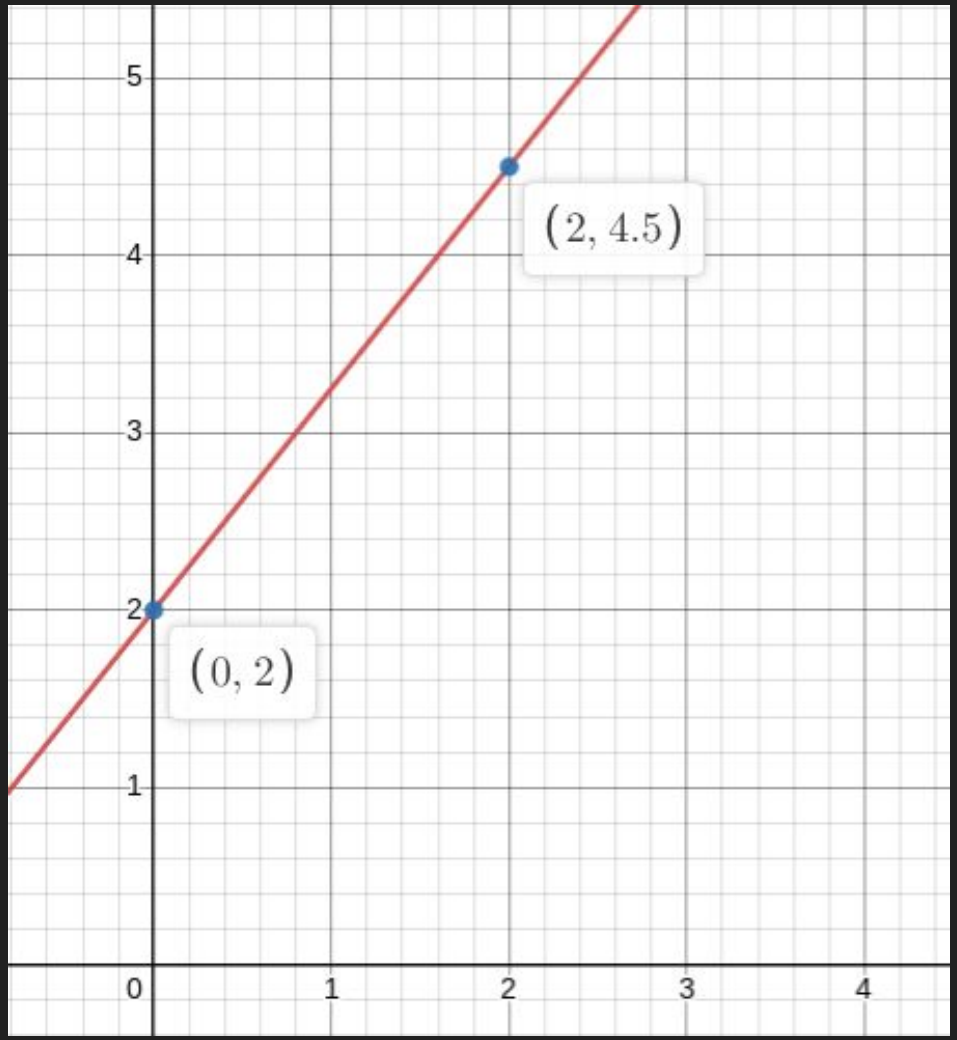
Problem 43

Find the median of the data set:

3, 11, 5, 14, 9, 90, 91, 0, 2

Problem 44

Find the slope of the line



Problem 45

Evaluate

$$4^0 + 5 - 3$$