π-Rates Spring 2025 Farewell Competition

Presented by the π-Rates Math Club

Problem 00 - WARM UP

Evaluate

1 + 1 + 1 + 1

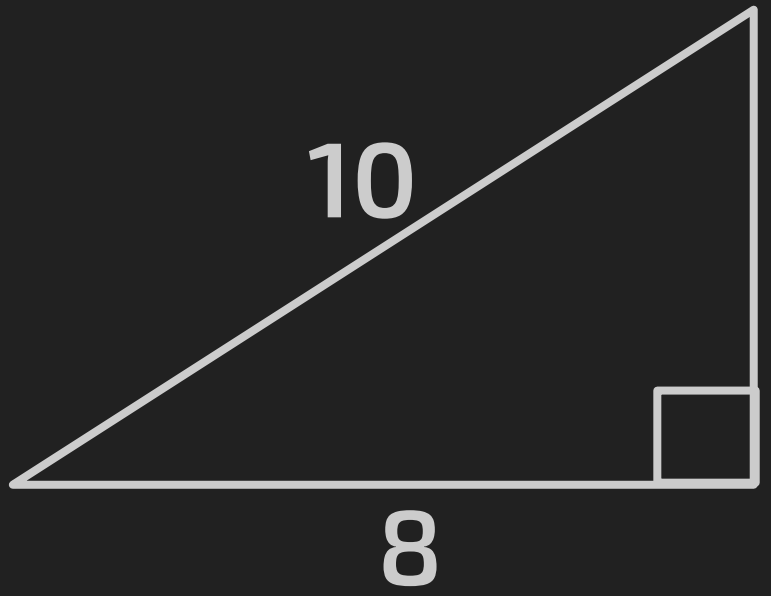
Problem 01

Evaluate

$$3(4 + 5) - 6$$

Problem 02

What is the area of the triangle?

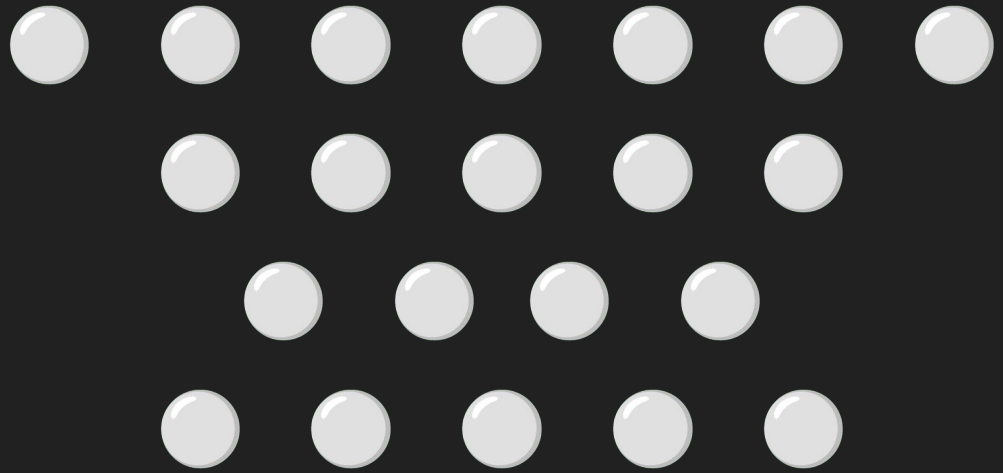


Problem 03

A pool is 25% full and has 50 liters of water. How many liters of water will be in the pool when it is 80% full?

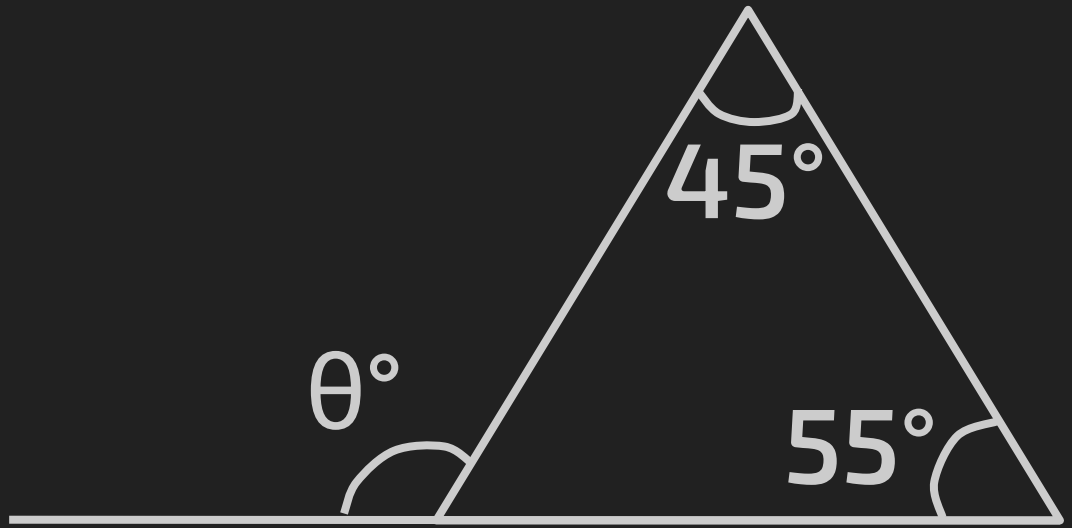
Problem 04

How many dots are there?



Problem 05

Find the measure of angle θ



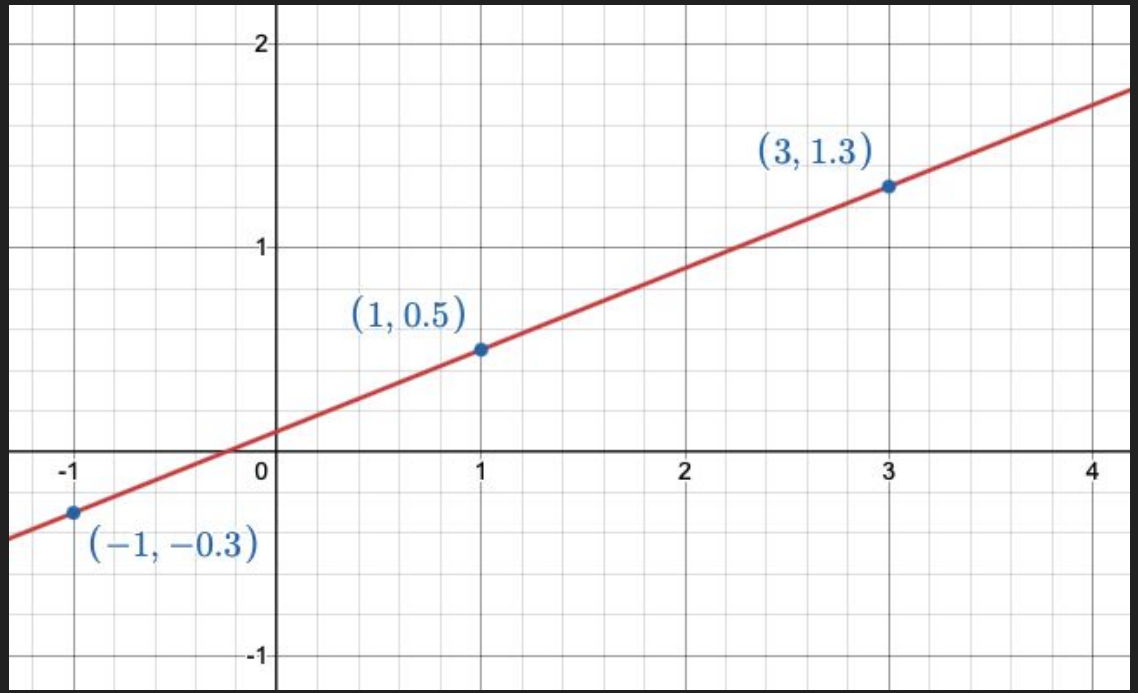
Problem 06

Find the median of the data set:

6, 8, 2, 5, 2, 6, 2, 7, 3, 9

Problem 07

Find the slope of the line



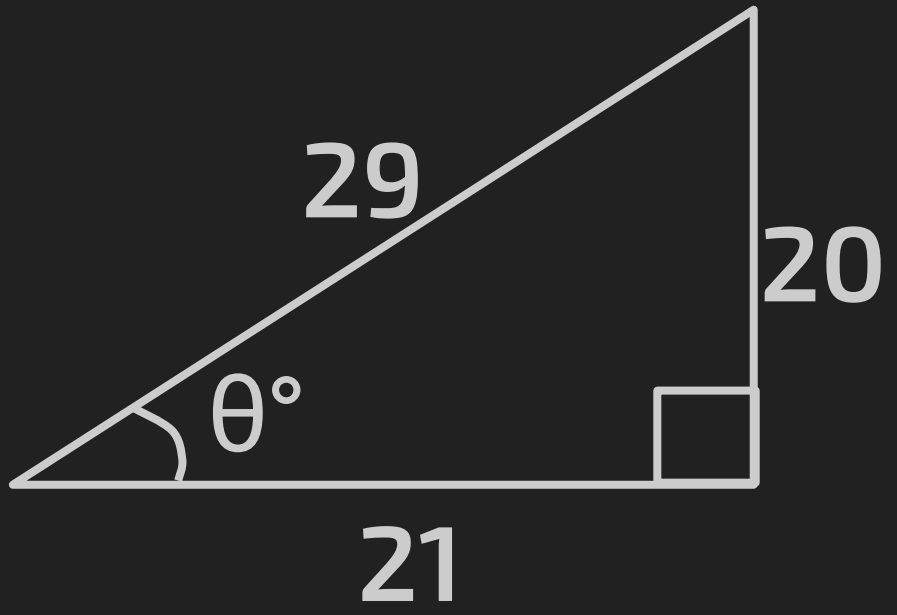
Problem 08

Solve for x

$$\log_2(x) = 3$$

Problem 09

What is the value of $\sin(\theta)$?

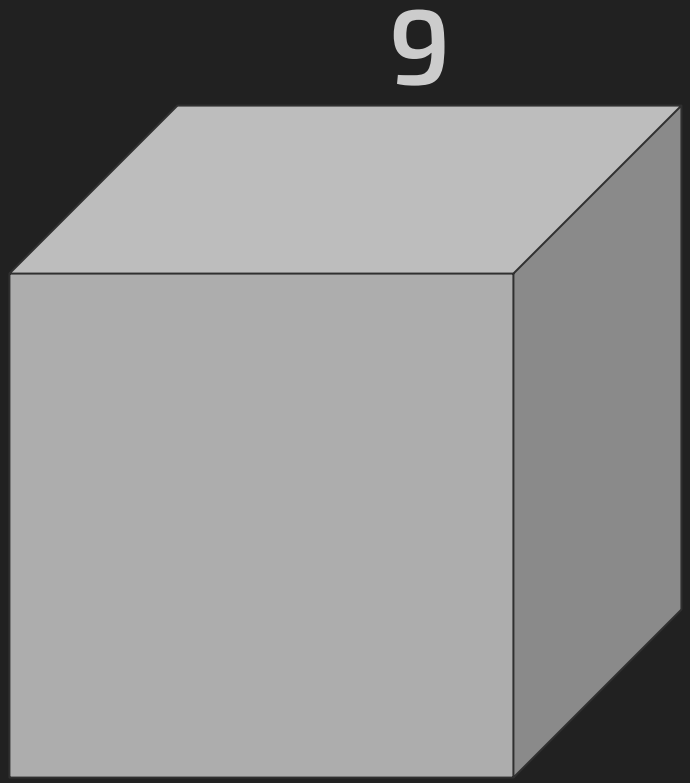


Problem 10

If MIT receives 28,000 applicants and has an acceptance rate of 5%, how many applicants were accepted?

Problem 11

What is the surface area of a cube with a side length of 9?



Problem 12

Evaluate

$$1^1 + 2^2 + 3^3 + 4^4$$

Problem 13

How many minutes are there in a year (365 days)?

Problem 14

What is the value of b?

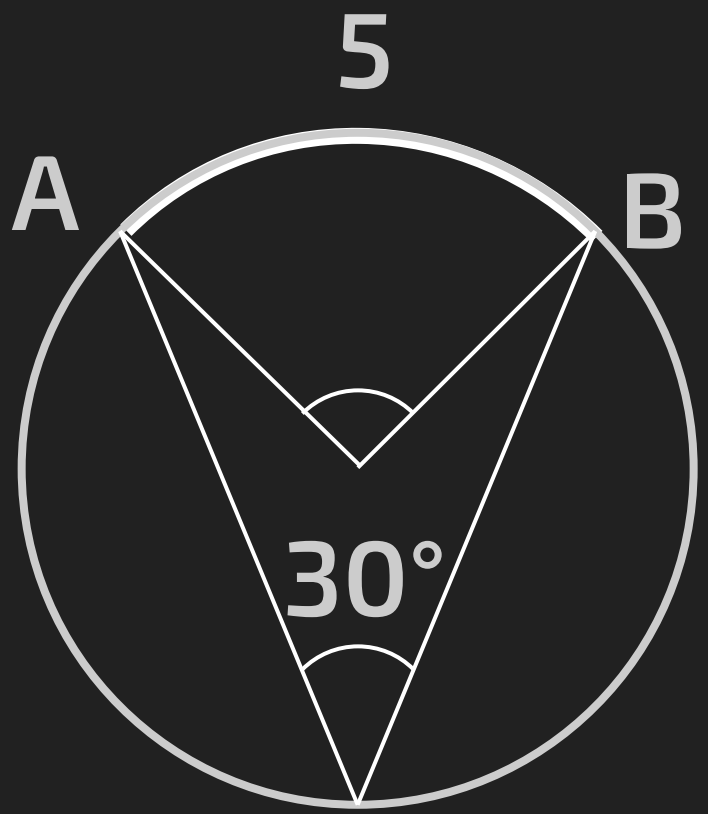
Problem 15

Find the mode of the data set:

11, 111, 1111, 11, 1, 1, 11, 2, 3, 111, 4, 1111

Problem 16

Find the circumference of the circle in terms of π. The length of arc AB is 5.



Problem 17

Find the x-intercept of the following line:

$$y = 6x + 5$$

Problem 18

A list of 5 numbers is created where the first number is 5 and each number afterwards in the list is 5 more than the number before it. What is the sum of all numbers in the list?

Problem 19

On a standard die with 6 faces, what will any two opposite sides add up to?

Problem 20

Solve for n

$$7n - 1 = 97$$

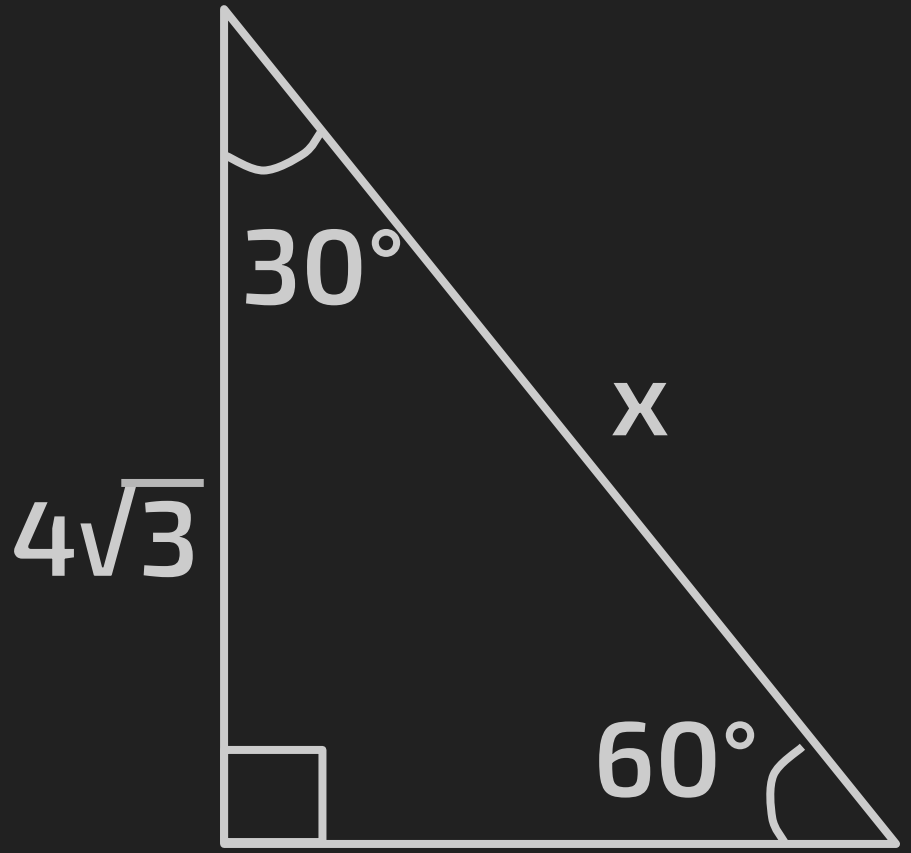
Problem 21

Find the x-intercept of the following radical equation:

$$y = \sqrt{x} - 4$$

Problem 22

What is the value of x?



Problem 23

Given that $3(14x + 2y) = 12$, what is the value of $9(7x + y)$?

Problem 24

It is -40°F. What is the temperature in °C?

$$°F = (°C * \frac{9}{5}) + 32$$

Problem 25

If $f(x) = 2x^2$ and $g(x) = 4 + x$,

what is the value of $f(g(4))$

Problem 26

Evaluate

$$21893 - 12398$$

Problem 27

Evaluate

$$823 \times 394$$

Problem 28

Anthony received the following scores on his past 5 tests: 82, 95, 35, 68, and 100. What is the minimum score Jonathan needs on his 6th test to have an test average of 80?

Problem 29

If $f(x) = 3x + 4$ and $g(x)$ is the inverse function of $f(x)$, what is the value of $g(2)$?

Problem 30

What is the distance between the points (-4,-5) and (2,3)?

Problem 31

Kristen reaches into a bag with a total of 30 blue and gold marbles. She currently has a 20% chance of selecting a blue marble. How many gold marbles should she add to have 35 gold marbles in the bag?

Problem 32

Solve for x

$$2(x+6)(2) = 72$$