π-Rates Spring 2025 Competition

Presented by the π-Rates Math Club

Problem 00 - WARM UP

Evaluate

1 + 1 + 1

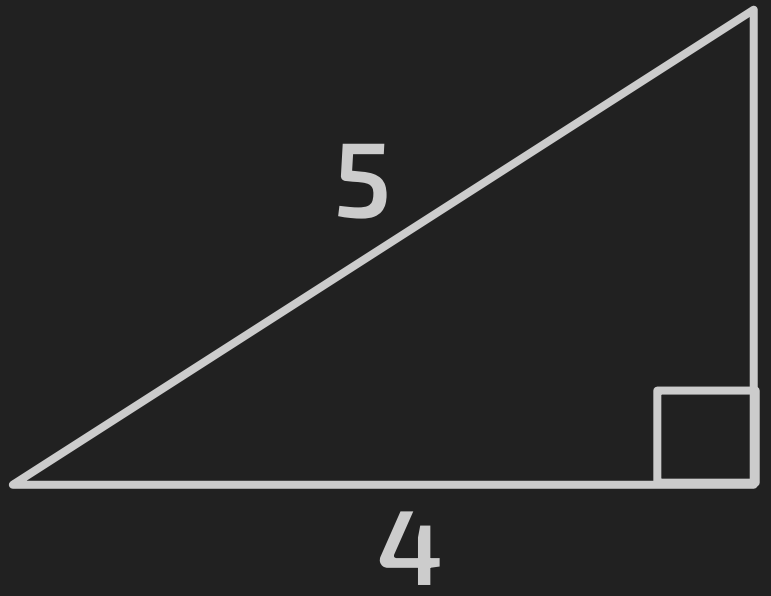
Problem 01

Evaluate

$$2(3 + 4) - 5$$

Problem 02

What is the area of the triangle?



Problem 03

Expand and Combine Like Terms

$$(x - 5)(x + 9)(x + 1)$$

Problem 04

A pool is 40% full and has 60 liters of water. How many liters of water will be in the pool when it is 90% full?

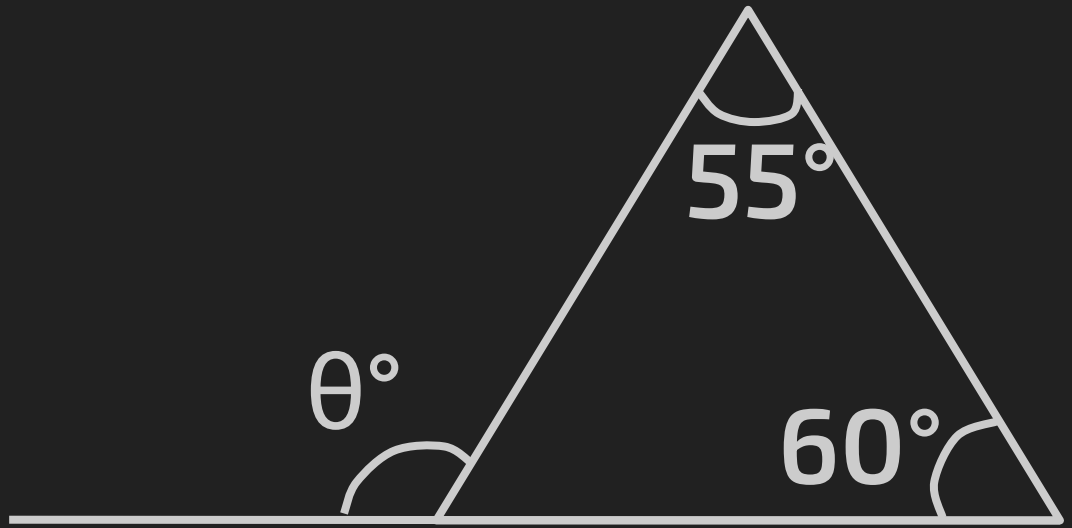
Problem 05

Simplify

$$2^{2^2} + (x^2 \square x \square x^8)$$

Problem 06

Find the measure of angle θ



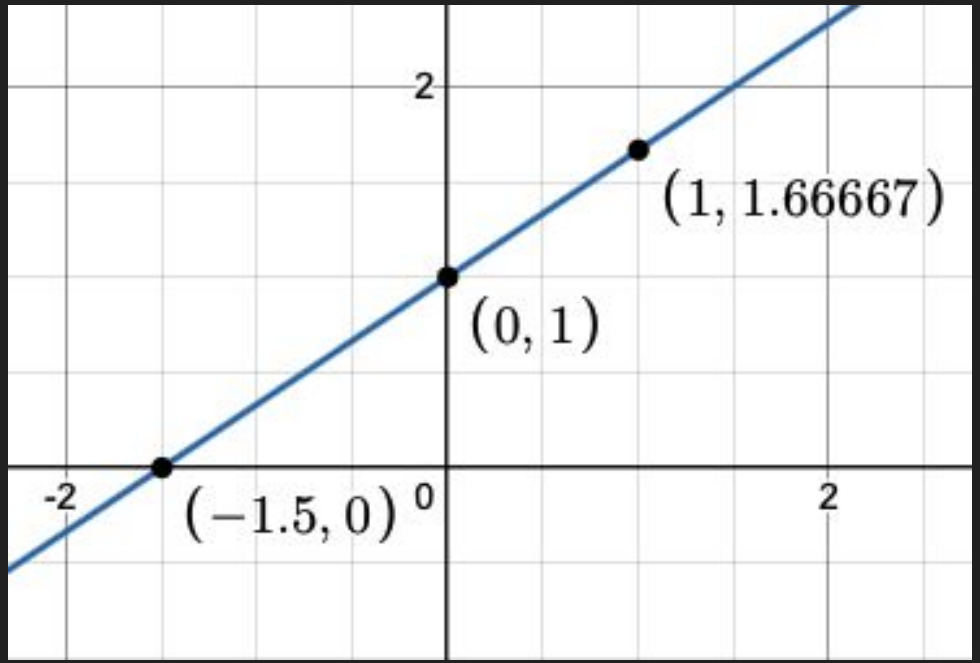
Problem 07

Find the median of the data set:

1, 6, 2, 9, 2, 4, 5, 6, 8, 10, 3

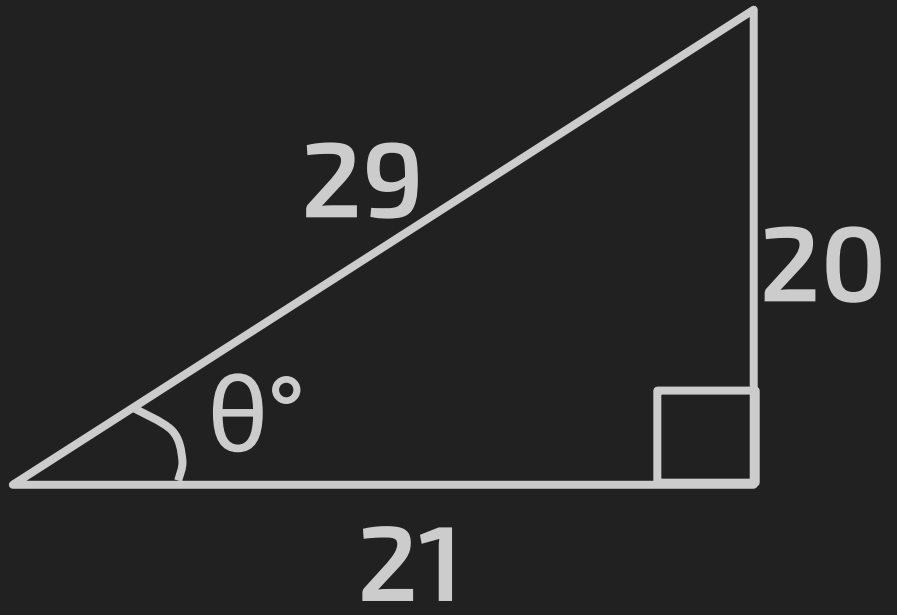
Problem 08

Find the slope of the line



Problem 09

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



Problem 10

The path of a diving bird is represented by the quadratic $y = t^2 - 5t + 7$, where t is time in seconds and y is the height of the bird in feet. At what time does the bird reach its lowest height?

Problem 11

Evaluate

$$2^2 - 4^3$$

Problem 12

What is the minimum number of coins you need to make exactly 49 cents?

Problem 13

What is the value of b?

Problem 14

Evaluate

$$1 + 2 - 3 + 4 - 5 + 6 - 7 + 8 - 9$$

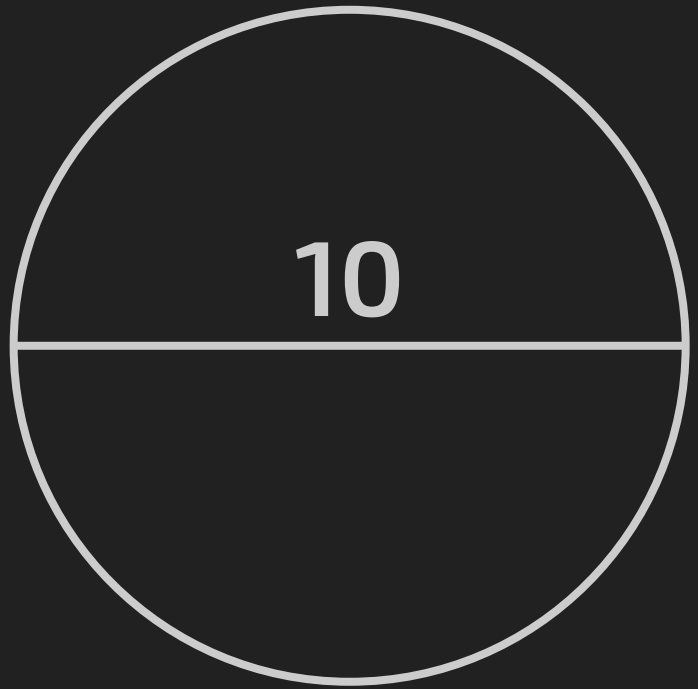
Problem 15

Find the mode of the data set:

1, 2, 3, 1, 2, 3, 4, 5, 6, 3

Problem 16

Using π=3.14, find the area of the circle



Problem 17

Find the x-intercept of the following line:

$$y = 5x + 6$$

Problem 18

If 3 consecutive even integers add up to 288, what is the smallest of the integers?

Problem 19

Solve for n

$$12n + 5 = 53$$

Problem 20

Find the x-intercept of the following radical equation:

$$y = \sqrt{x} - 2$$

Problem 21

If each letter is assigned a number based on its position in the alphabet (a=1, b=2 …y=25, z=26), what is the sum of the numbers that represent each letter in “math”?

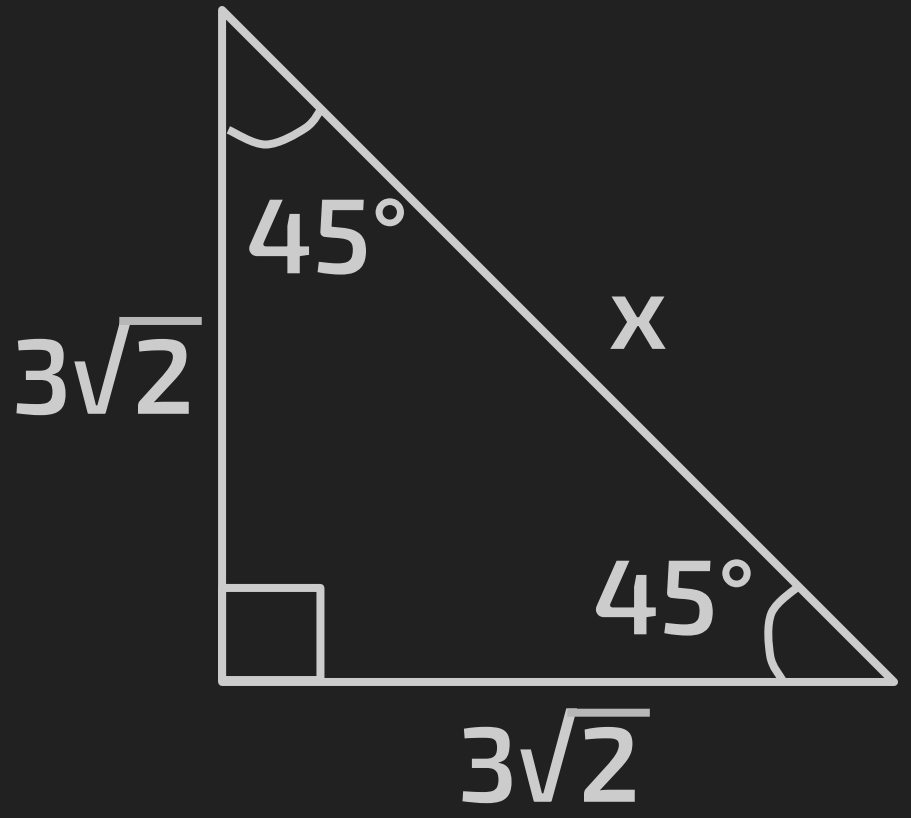
Problem 22

Evaluate

$$(4 - 17^3)(1111 - 2387 + 23^2)(2 - 2)$$

Problem 23

What is the value of x?



Problem 24

Given that $2(11x + 41y) = 11$, what is the value of $8(11x + 41y)$?

Problem 25

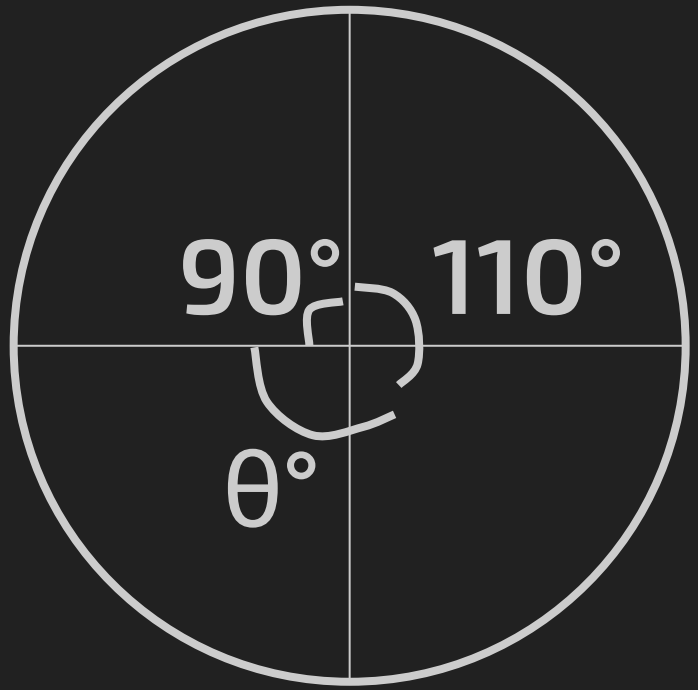
Newton, Archimedes, and Euclid walk a combined 839 miles. If Newton walked 45 more miles than Archimedes, and Euclid walked 11 miles more than Newton, how many miles did Newton walk?

Problem 26

Casey scored an 87%, 84%, and 92% on her first three tests. What is the lowest score she can receive on her fourth test to have a 90% test average?

Problem 27

Find the measure of angle θ



Problem 28

Combine

$$3 + \frac{3}{4}$$

Problem 29

Evaluate

$$\frac{-3^2 \text{ 🔶 } (-2)^2}{7 - (-2)}$$

Problem 30

What is the area of the trapezoid?

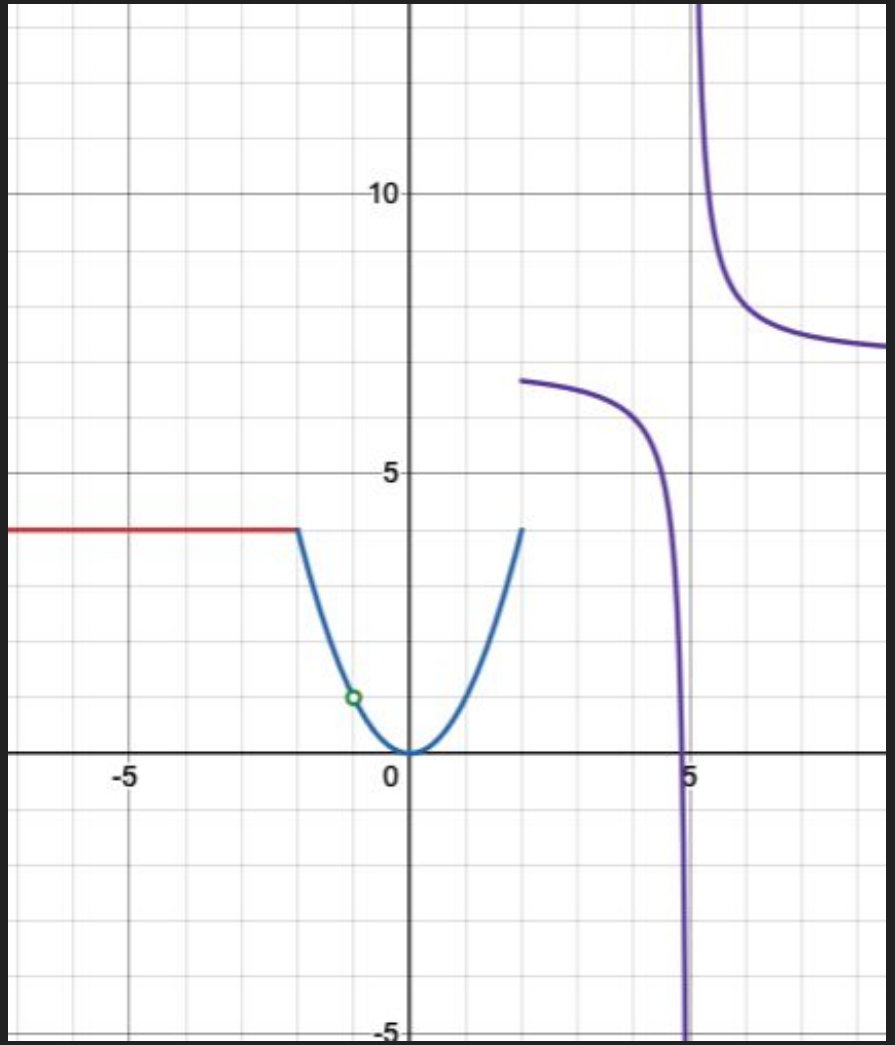
Problem 31

Expand and Combine Like Terms

$$(2x + 3)(3x - 8)$$

Problem 32

Identify the number of discontinuities for the graphed function on the interval shown



Problem 33

If $f(x) = 3x^2$ and $g(x) = 6 + x$,

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

Problem 34

Simplify

$$\frac{9x^2(2y^3)}{3xy}$$

Problem 35

Find the mean of the data set:

13, 45, 9, 23, 65

Problem 36

Using π=3.14, find the circumference of the circle

Problem 37

Find the y-intercept of the following line:

$$2x + 3y = 6$$

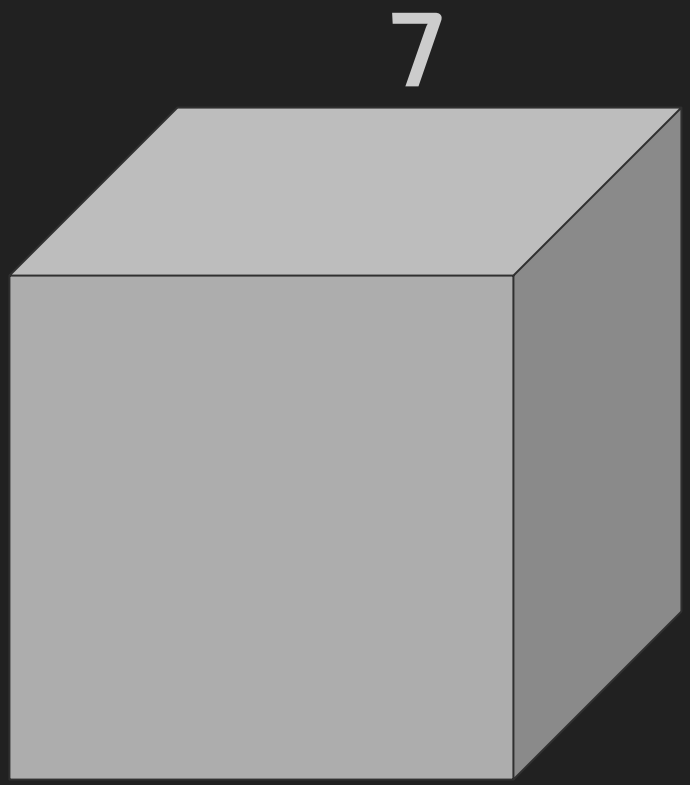
Problem 38

Find the largest solution to the following quadratic equation:

$$y = x^2 - 7x + 10$$

Problem 39

What is the surface area of a cube with a side length of 7?



Problem 40

Solve for the three x-intercepts of the following cubic equation:

$$y = x^3 + 6x^2 + 8x$$

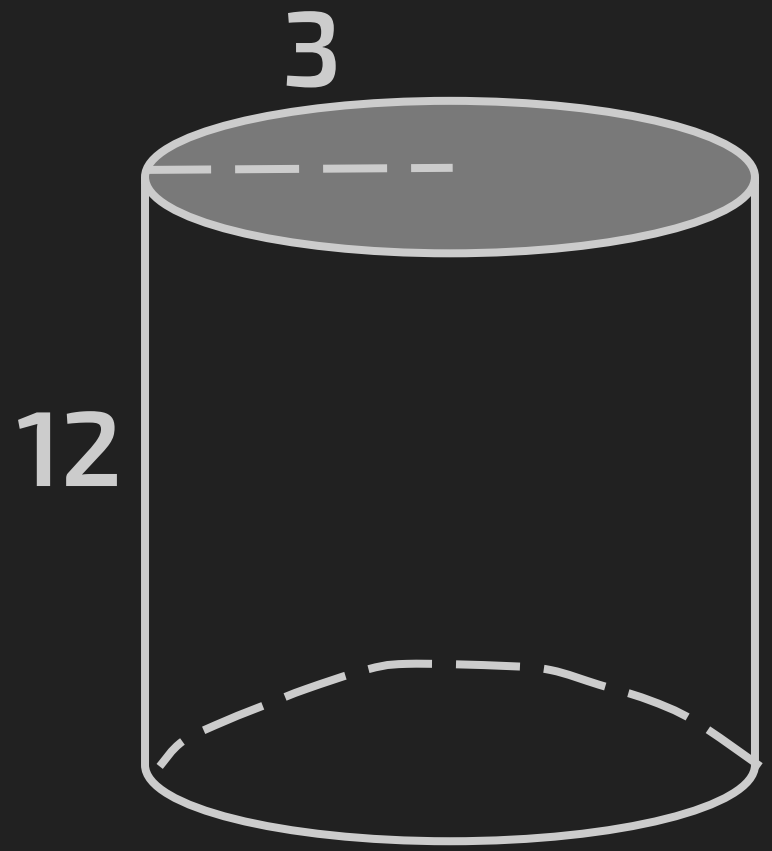
Problem 41

Solve for x

$$\log_3(x) = 4$$

Problem 42

What is the volume of the following cylinder (in terms of π?



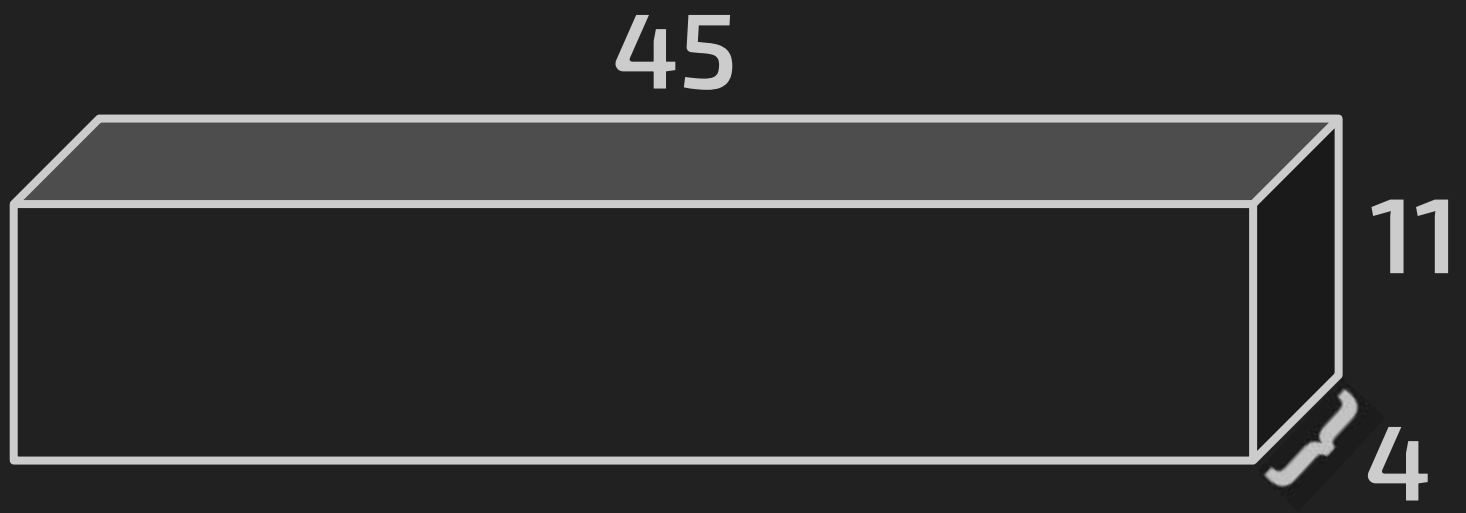
Problem 43

Solve for the solution set of r

$$4r - 38 > 82$$

Problem 44

Find the volume of the following rectangular prism

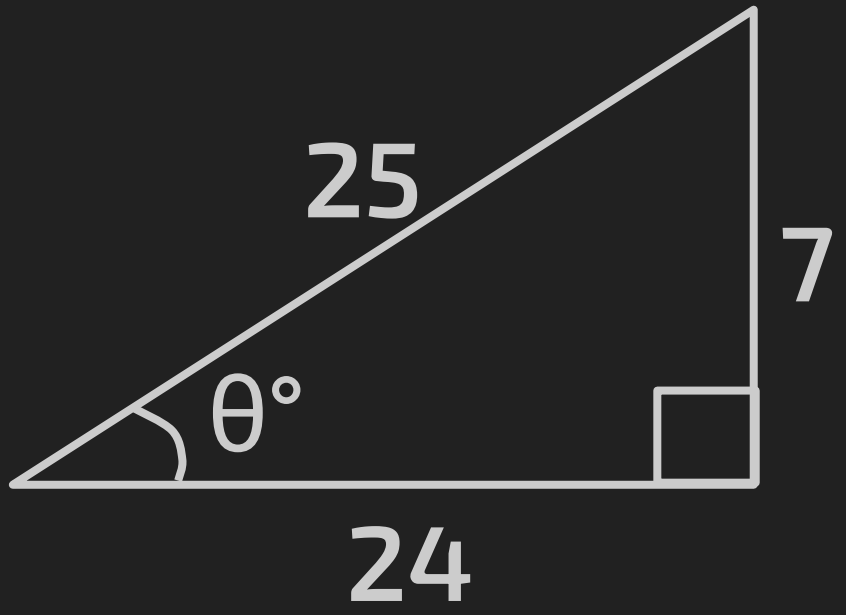


Problem 45

What is the area of a rectangle with a perimeter of 70 feet and a width that is 5 feet longer than the length?

Problem 46

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



Problem 47

Solve for the x and y that satisfies the following systems of equations:

$$2x + y = 3$$

$$y - 1 = x$$

Problem 48

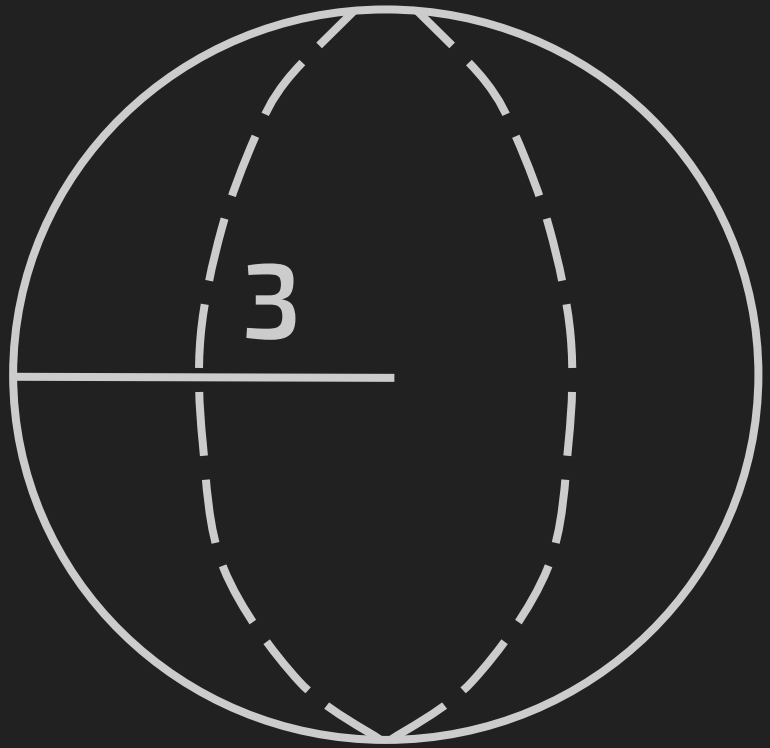
Speedy Samuel writes 1140 research papers in 19 hours. How long did it take for him to write 120 research papers?

Problem 49

Given the following transversal with parallel lines, find the measure of angle θ

Problem 50

Find the volume of the following sphere (in terms of π)



Problem 51

If $f(x) = x^2$, what does $f(x)$ approach as x approaches negative infinity?