

π -Rates Interscholastic Spring 2024 Competition

Presented by the π -Rates Math Club

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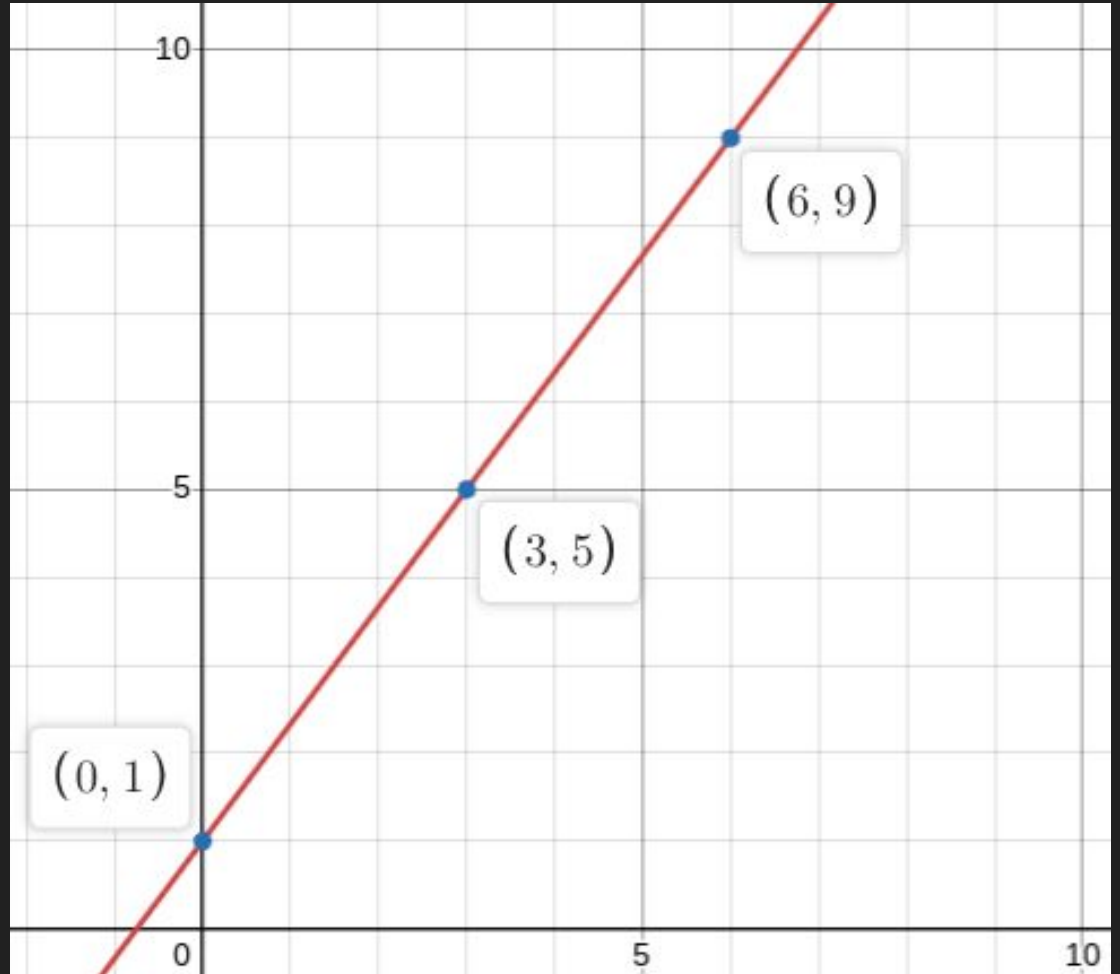
Problem 01

Evaluate

$$5^2 + 5^3$$

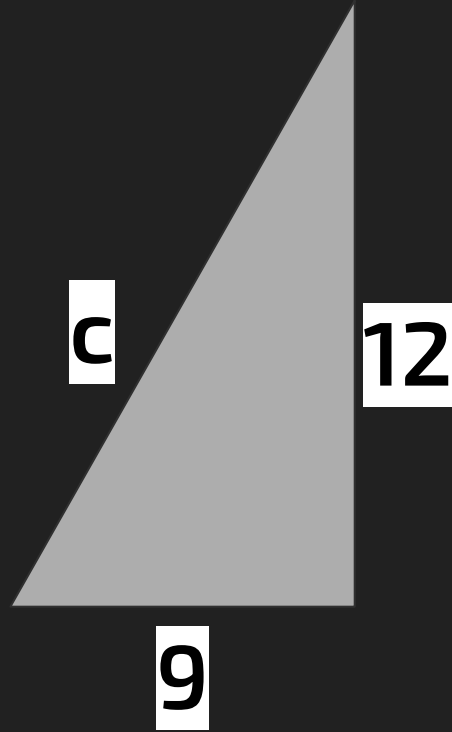
Problem 02

Find the
slope of the
line



Problem 03

What is the
value of c ?



Problem 04

A store owner makes \$1080 in profit each day. How much, on average, does the store owner make per hour?

Problem 05

Solve for the smallest solution of x

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

Problem 06

Evaluate

$$1 + 3 + 5 + 7 + 9$$

Problem 07

Find the solution set of x that satisfies the following inequality:

$$6x - 8 > 7$$

Problem 08

Solve for the x value where $f(x) = 0$

$$f(x) = \frac{(x-5)^2}{9}$$

Problem 09

It is 85°F in Sacramento and 10°C in New York. What is the difference in temperature, in Fahrenheit, between these two places?

$$^{\circ}\text{F} = (^{\circ}\text{C} * \frac{9}{5}) + 32$$

Problem 10

The sum of 4 consecutive odd integers equals 280. What is the smallest of the 4 integers?

Problem 11

An business that makes \$2800 in profit per week makes a \$168000 investment. How many weeks will it take for the business to make back the money from its investment?

Problem 12

Find the median of the data set:

79, 100, 7, 56, 5, 77, 26, 61, 73, 89, 101

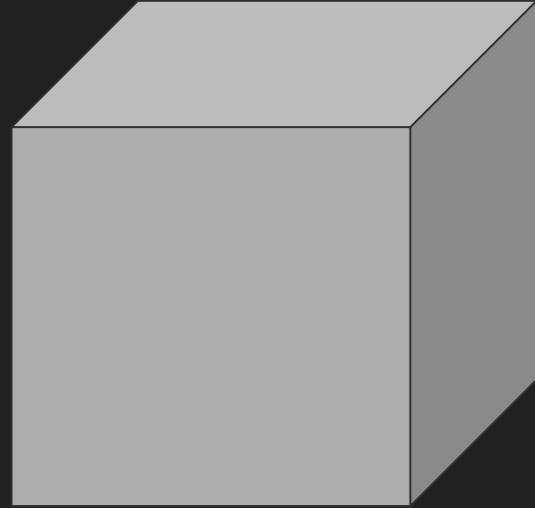
Problem 13

Evaluate

$$50 - 1 - 2 - 3 - 4 - 5$$

Problem 14

Find the
volume of the
cube



11

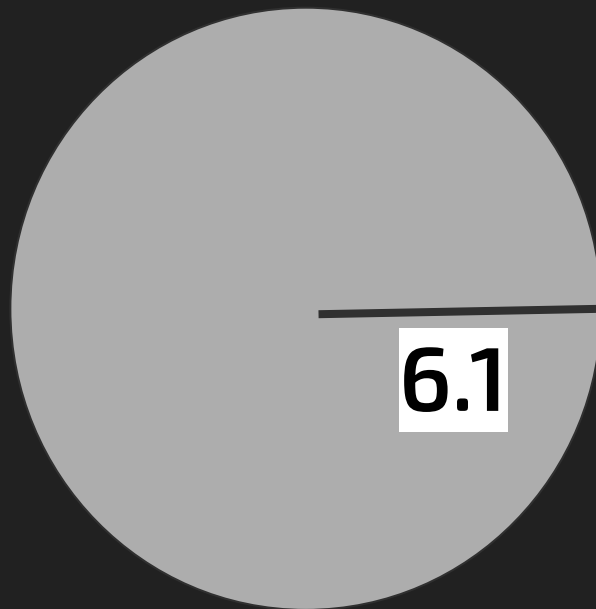
Problem 15

Expand

$$4x * (3x + 6) * 2x$$

Problem 16

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

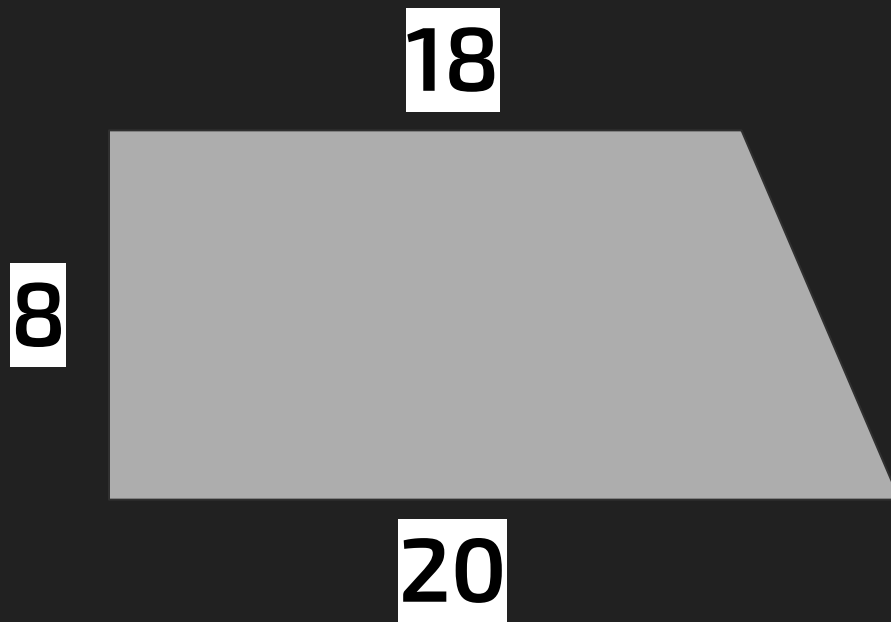


Problem 17

How much money do I have in total
with 7 quarters, 11 dimes, 4 nickels,
and 3 pennies?

Problem 18

What is the
area of the
trapezoid?



Problem 19

I buy a total of 40 red and blue tickets and spend a total of \$150. Red tickets cost \$2 each and blue tickets cost \$4 each. How many tickets of each color did I buy in total?

Problem 20

Evaluate

$$\frac{(37 + 68) * 3}{5}$$

Problem 21

After being shortened by 20%, a test is 2 hours long. How long, in minutes, was the original test?

Problem 22

Solve the equation for x

$$4(3x-5) = 2x + 8$$

Problem 23

Find the mode of the data set:

3, 8, 3, 6, 8, 99, 23, 1, 2, 2, 1, 3

Problem 24

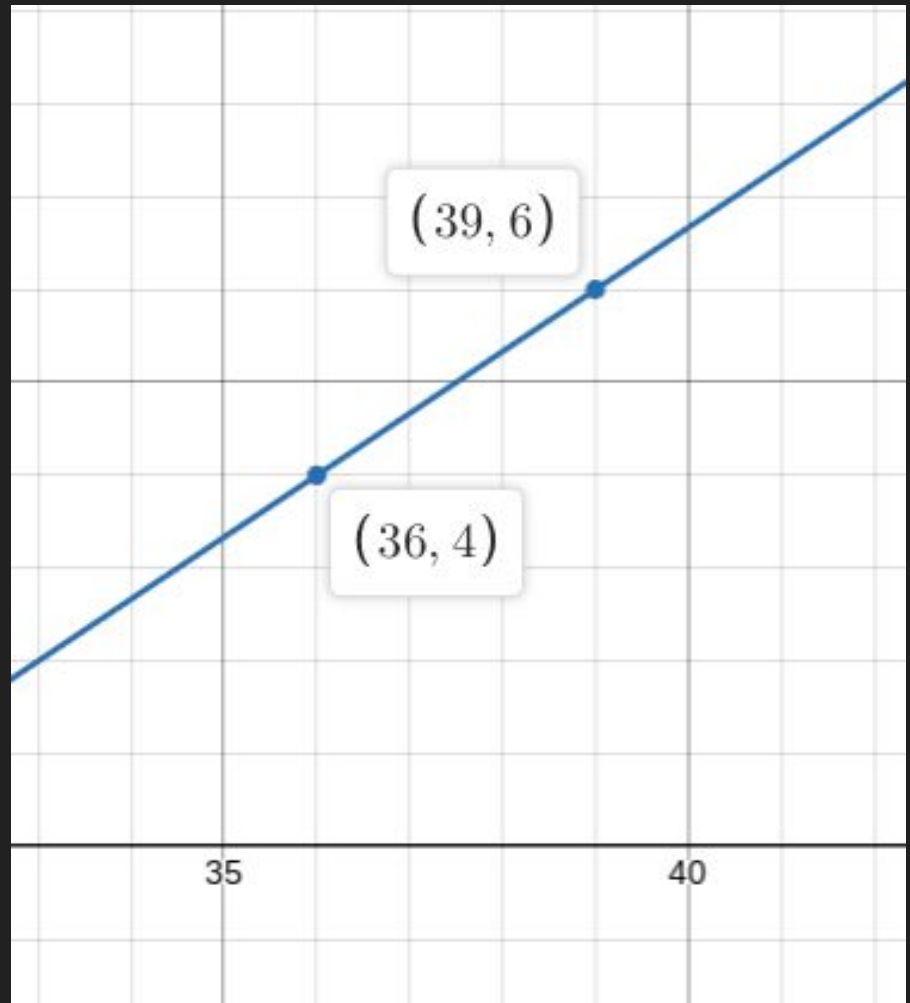
Solve for the (x,y) pair that satisfies the following system of equations

$$3x + 6 = 2y$$

$$4x - 2y = 10$$

Problem 25

What is the
y-intercept
of this line?



Problem 26

Expand

$$-2(8x - 9) + 7$$

Problem 27

An electric car costs \$49000. How much do I have to pay if I want to buy 4 electric cars(ignoring tax)?

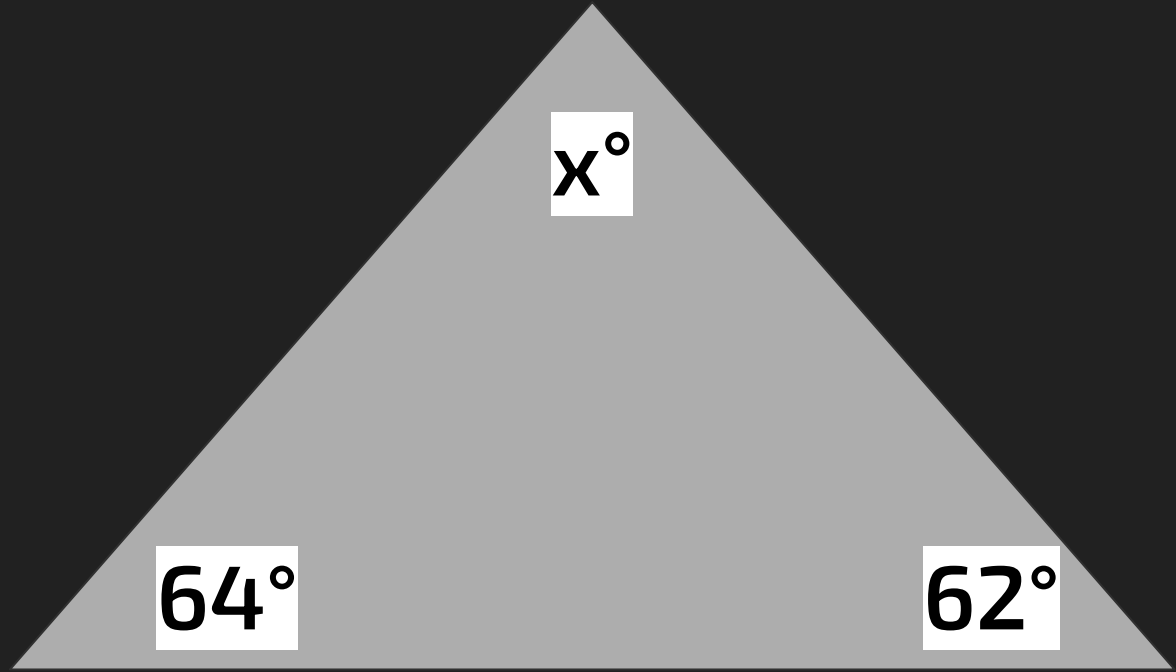
Problem 28

Write the following fraction as
a mixed number:

$$\frac{89}{4}$$

Problem 29

What is the
value of x ?



Problem 30

Simplify and expand

$$\frac{5(4x-8)}{2}$$

Problem 31

Evaluate

$$234 \times 239 \times 34$$

Problem 32

What is the total volume of a box with dimensions of 7, 13, and 5?

Problem 33

Solve the equation for x

$$3x + 9 = 5.5x - 4$$

Problem 34

Solve the equation for x

$$2^x = 32$$

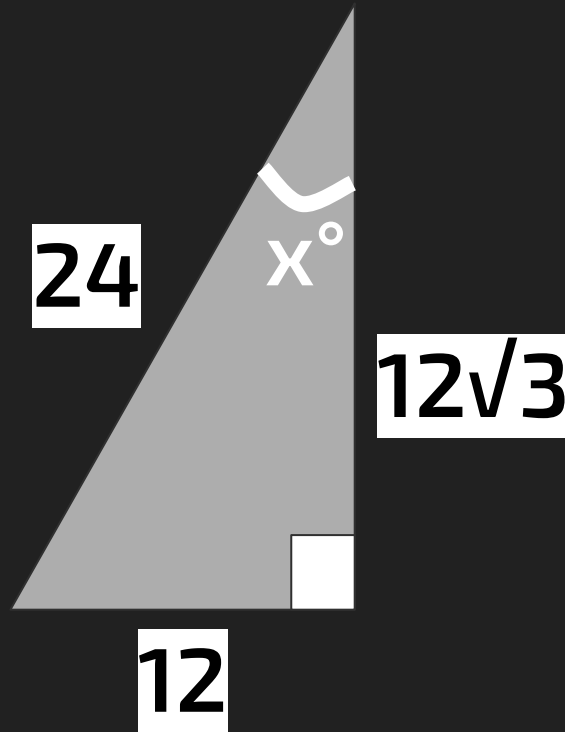
Problem 35

Solve for the largest x-intercept of

$$f(x) = 6x^2 - 4x - 16$$

Problem 36

What is the
value of x ?



Problem 37

Find all 3 solutions for x

$$3x^3 - 8x^2 + 4x = 0$$

Problem 38

You start off with 200 marbles. Every day that passes, you only keep 80% of the marbles that you had the previous day. How many marbles do you have after 2 days?

Problem 39

Find the solution set of x that satisfies the following inequality:

$$-2x + 5 < 2$$

Problem 40

Solve for the (x,y) pair that satisfies the following system of equations

$$3x + 6 = 3y$$

$$6x + 3 = 2y$$

Problem 41

Find the median of the data set:

7, 3, 5, 8, 2, 9, 10, 11, 200, 29, 4

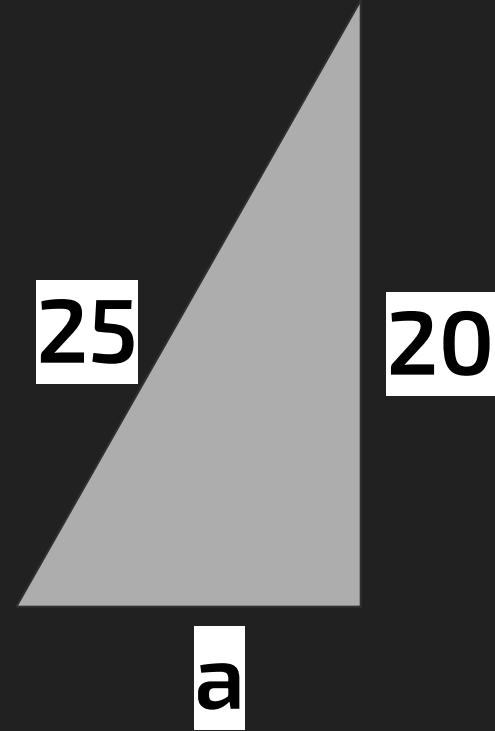
Problem 42

What is the y-intercept of the following function?

$$f(x) = 34x^6 - 2x^5 + 47x - 7$$

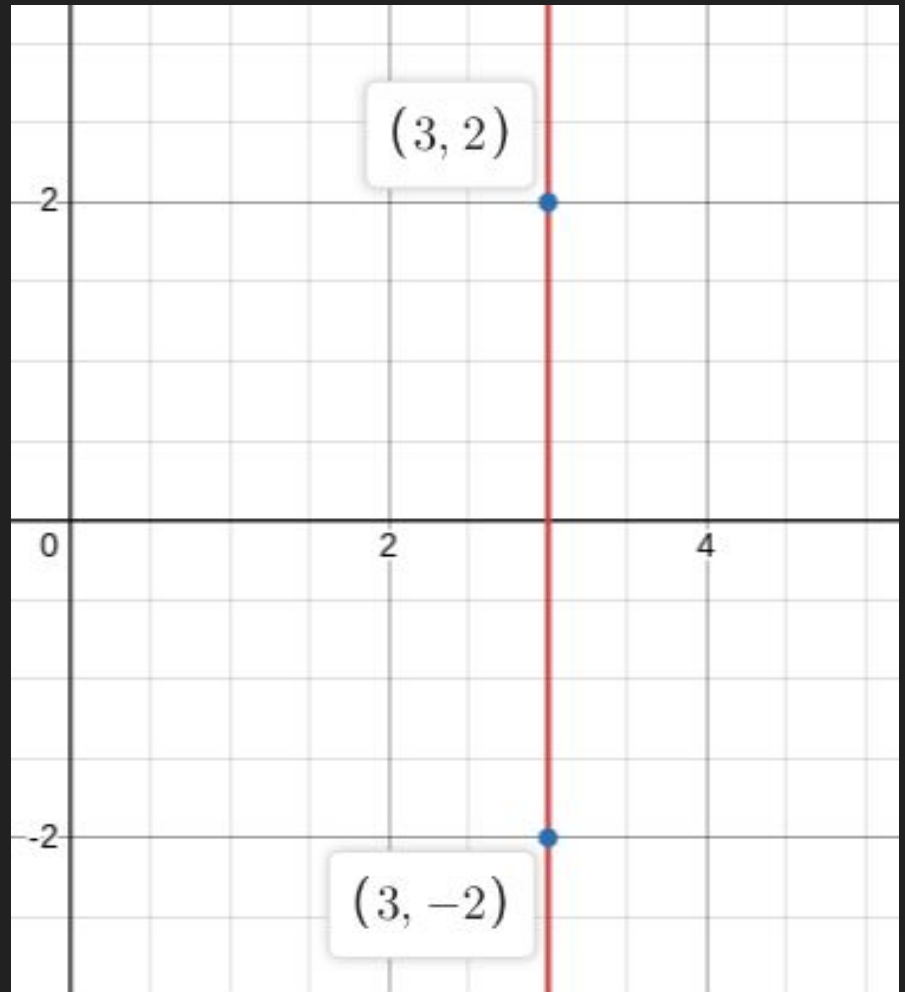
Problem 43

What is the
value of a ?



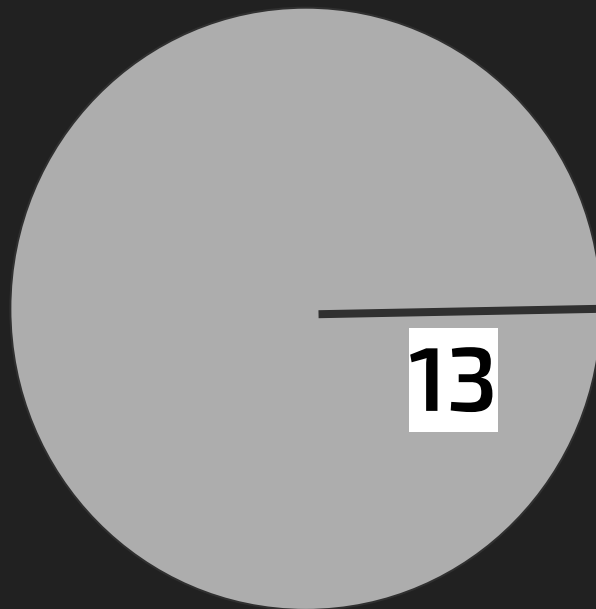
Problem 44

Find the
slope of the
line



Problem 45

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



Problem 46

If I traveled 513 miles at a rate of 38 miles per hour, how much time have I spent traveling?

Problem 47

Write the following fraction as
a mixed number:

$$\frac{12938}{8}$$

Problem 48

A TV screen has the dimensions x and y , where x is 5 units larger than y . If the TV screen has an area of 50 un^2 , what are its dimensions?

Problem 49

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

$$f(x) = 3x$$

Problem 50

If the temperature of a container is -40°F , what is the temperature of the container in $^{\circ}\text{C}$?

$$^{\circ}\text{F} = (^{\circ}\text{C} * \frac{9}{5}) + 32$$

Problem 51

The height of a projectile t seconds after it was launched is given by the function $f(t) = -t^2 + 4t + 2$. How many seconds after launch does the projectile reach its maximum height?

Problem 52

The product of 2 consecutive positive and even integers equals 288. What are the two integers?

Problem 53

The value of a car initially worth \$40000 is reduced by 15% per year. How much is the car worth after 3 years?

Problem 54

Jonathan received the following scores on his past 5 tests: 60, 70, 46, 73, 91. What is the minimum score Jonathan needs on his 6th test to have an test average of 70?

Problem 55

Solve the equation for x

$$\frac{8x - 2}{5} = 6$$

Problem 56

Find the mean of the data set:

3, 8, 25, 4, 6, 92

Problem 57

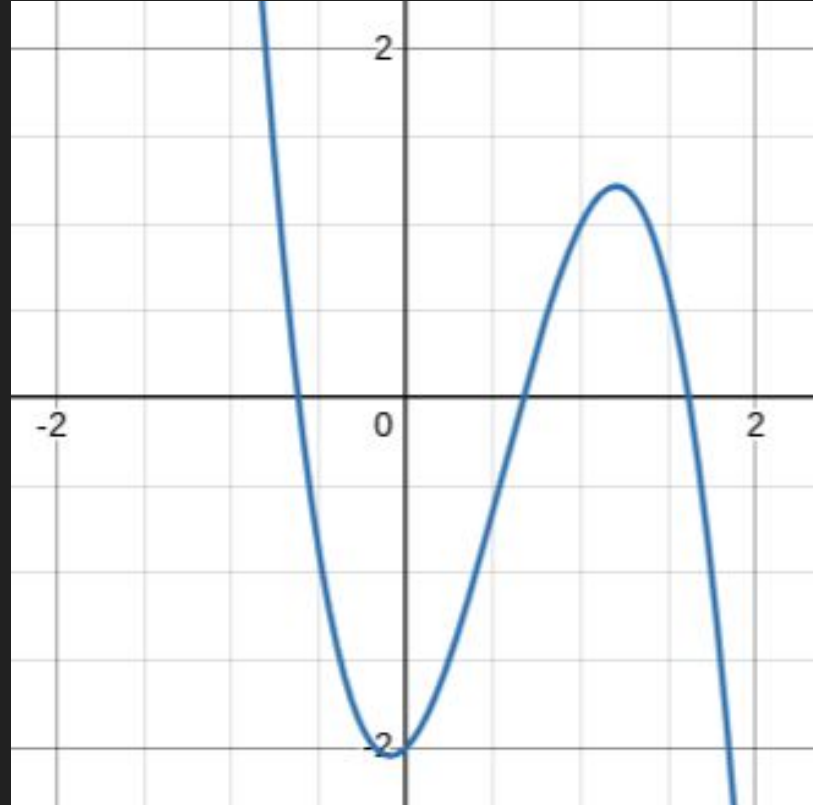
Given that $3(6x + 38y) = 10$,
what is the value of
 $9(3x + 19y)$?

Problem 58

A list of 6 numbers is created where the first number is 4 and each number afterwards in the list is 7 more than the number before it. What is the sum of all numbers in the list?

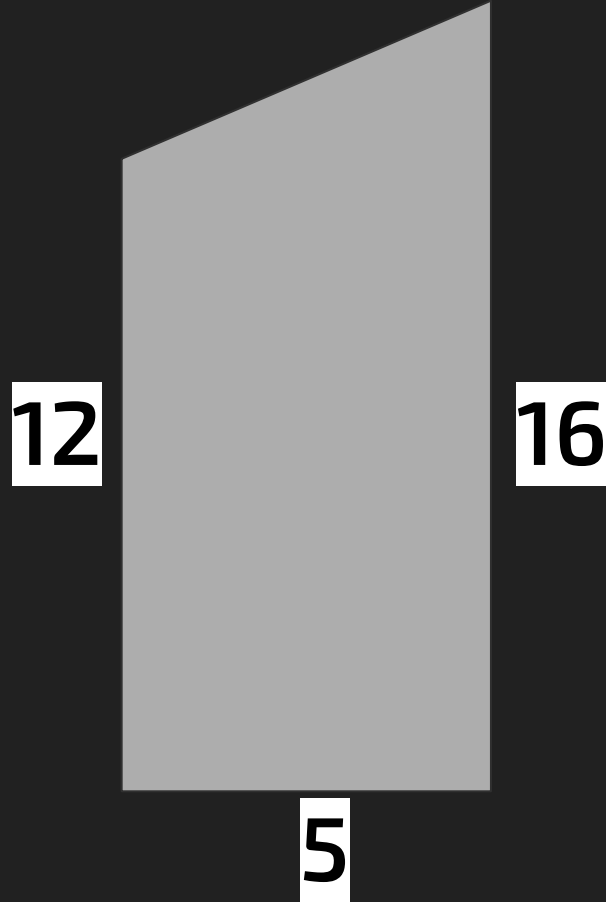
Problem 59

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



Problem 60

What is the
area of the
trapezoid?



Problem 61

Solve the equation for x

$$33x + 2387 = 1298$$