## Math Challenge



## My Name:

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Start on the square. Draw exactly 12 lines without picking up your pencil to connect all the circles.


Name:

Zachary has four times as many pennies as dimes. The total value of the coins is $\$ 1.68$. How many of each coin does he have?

If Ryan had five more nickels and twenty-four more quarters, he would have the same number of nickels, quarters, and pennies. Ryan has a total of $\$ 4.91$. How many of each coin does he have?

Anna has a total of one hundred fifty-six pennies, nickels, and quarters. She has a total of $\$ 15.76$. She has sixteen more quarters than nickels and thirteen fewer quarters than pennies. How many of each coin does she have?

Ethan has eight fewer pennies than dimes.
Ethan has a total of fifty-eight pennies and dimes. How much money does he have?
$\square$
Name:
"Hey, Ted!" called out his friends. But Ted didn't reply. He was texting. They don't call him Texty Ted for nothing! Ted sends an average of 57 texts in only 4 minutes. At precisely 3:23 Ted finally sat down outside of school to play his phone. He played his phone until 3:52 when his phone ran out of power. How many texts do you think Texty Ted sent?

Mary needs to make these two fractions equal. Help her find the missing number!

$$
\frac{? ?}{60}=\frac{54}{90}
$$

Name: $\qquad$

Sean is eleven years older than Olivia, who is six years older than Natalie. The sum of their ages is fifty-nine. How old is Natalie?

Seventeen years ago, David was six less than one-half as old as Emma was. Today, Emma is thirty-eight less than three times the age of David. How old is Emma?

Jasmine is one-third the age of Andrew. Tyler is one-half the age of Andrew. The sum of their ages is thirty-three. How old is Tyler?

Alexander is four years older than Ashley, who is four years older than Justin. The sum of their ages is 49 and one-half years. How old is Ashley?
$\square$
Name: $\qquad$
Fill in the missing numbers. How? The sum of the four surrounding numbers is in the center of each square. Exactly one of the four numbers has to be one of these numbers: $6 \frac{1}{2} 9 \frac{4}{5}$ or $7 \frac{6}{7}$. The other three numbers have to all be DIFFERENT and must be from these: $2 \frac{1}{2} \frac{1}{2} 8 \frac{1}{2}$ or $3 \frac{1}{2}$.


Name: $\qquad$

The measures of two angles in a complementary triangle are in the ratio of $1: 2$. What is the measure of the larger angle?

The measures of two angles in a triangle are in the ratio of $8: 10$. The measure of the smaller angle is forty-eight degrees less than two times the larger angle. What is the measure of the smaller angle?

The measures of two angles in a triangle are in the ratio of $1: 14$. The measure of the larger angle is sixty-six degrees more than three times the smaller angle. What is the measure of the smaller angle?

The difference between the measures of an angle and its complement is forty-two degrees. What are the measures of the two angles?

Name: $\qquad$

Nathan drove for eight hours at an average speed of 46 mph . He drove 41 mph during the first three hours of his trip. How fast did she drive during the last 5 hours?

Matthew can run $6 \frac{1}{7}$ miles in one hour. How many miles can Matthew run in fifteen minutes?

Amber drove eight miles to Amanda's house at thirty-three mph. She then drove fifteen miles to Taylor's house.

For the entire trip, Amber averaged a speed of $36 \frac{183}{269} \mathrm{mph}$. What was her average speed driving from Amanda's to Taylor's house?

Dylan drove to the mall, which is twenty kilometers away. He left at $1: 56$ and arrived at the mall at 2:25. What was his average driving speed?
$\square$
Name: $\qquad$


## Equations and Hints:

Each letter is a whole number.
Fill in the equations using the chart:

$$
\begin{aligned}
& C+A+C=32 \quad A+C+B=\ldots \\
& \ldots+\ldots x_{-}=103 \quad X^{+} x^{+}=76
\end{aligned}
$$

Additional hints:
A $<12$
$C=A+4$

Show Work:

$$
?=
$$

The old mine near Smallville used to produce a lot of silver ore. The ore deposit has been pretty much depleted now though. Today the ore removal is only about $20 \%$ of what it was 30 years ago. If an average of 2.4 million tons per year were removed 30 years ago, what is the current ore removal rate? Express your answer using scientific notation.

Rosa is designing a new hog watering system for a farm. There is a large tank that must store water above ground. In addition, the tank must be on stilts, so that vehicles can drive under it. She only has wood to make the stilts out of, so she wants to limit the total mass of the tank and water to a safe amount. She calculates that the support she designs will safely hold up a $25,500 \mathrm{~kg}$ mass. If the tank itself has a mass of $3,732.18 \mathrm{~kg}$, what volume of water (in liters) can it hold?

How many 5-letter combinations are possible from the first nine letters of the alphabet?

In Bigtown Creek, the flow of sediment is slowly decreasing as more and more of the drainage area around the creek is developed and covered by concrete. Ten years ago a measurement was made by the local university and an average mass of about 14 grams of sediment per hour was moving down the creek. Now the average sediment flow is only about $35 \%$ of that. What is the current mass sediment flow? Round your answer to the nearest tenth.

Jason has a challenging training regimen. He trains for two hours every other day. Out of these two hours, he jogs for 12 minutes, stretches for 7 minutes, sprints for 6 minutes, rides a bicycle for 13 minutes, and lifts weights for 35 minutes. The remaining time he is resting. What fraction of his training time is spent resting?

A racecar goes from 135 MPH to zero MPH in 14 seconds. What is the car's acceleration? Round your answer to the nearest tenth.

Name:

Which is bigger, half of 24 or one-fourth of 96 ?

Mr. Fleep had a new flying disk design.
He made some calculations and decided if he could make a flying disk that had a perimeter exactly four times the diameter that it would be more aerodynamically stable than a "standard" flying disk and thus fly further. Is his design possible? Why or why not?

Mr. Jones has to mix a fertilizer solution for his garden. The instructions on the package say to dissolve one-fourth of a cup of fertilizer in 5 gallons of water. He has a 40-gallon tank that he pulls with a yard tractor. He only puts 25 gallons of water in the tank each time. How many cups of fertilizer does he need to add to the tank before filling it with water?

Of the approximately 197,000 insect species estimated to exist on Weird Island, most have yet to be discovered. In fact, just this year it was estimated that about one-fifth of the species presumed to exist on the island had been discovered. What is the ratio of discovered to undiscovered species?

## Page 1 Answers

1 forty-eight pennies and twelve dimes
2 sixty-six pennies, thirty-seven nickels, and fifty-three quarters

3 thirty-six pennies, thirty-one nickels, and twelve quarters

4 The total value of the coins is $\$ 3.55$. (twenty-five pennies and thirty-three dimes)

## Page 3 Answers

112
29
364
416 and one-half years

## Page 5 Answers

1
$60^{\circ}$
2
$32^{\circ}$
3
$6^{\circ}$
4
$24^{\circ}$ and $66^{\circ}$



