

Math Challenge

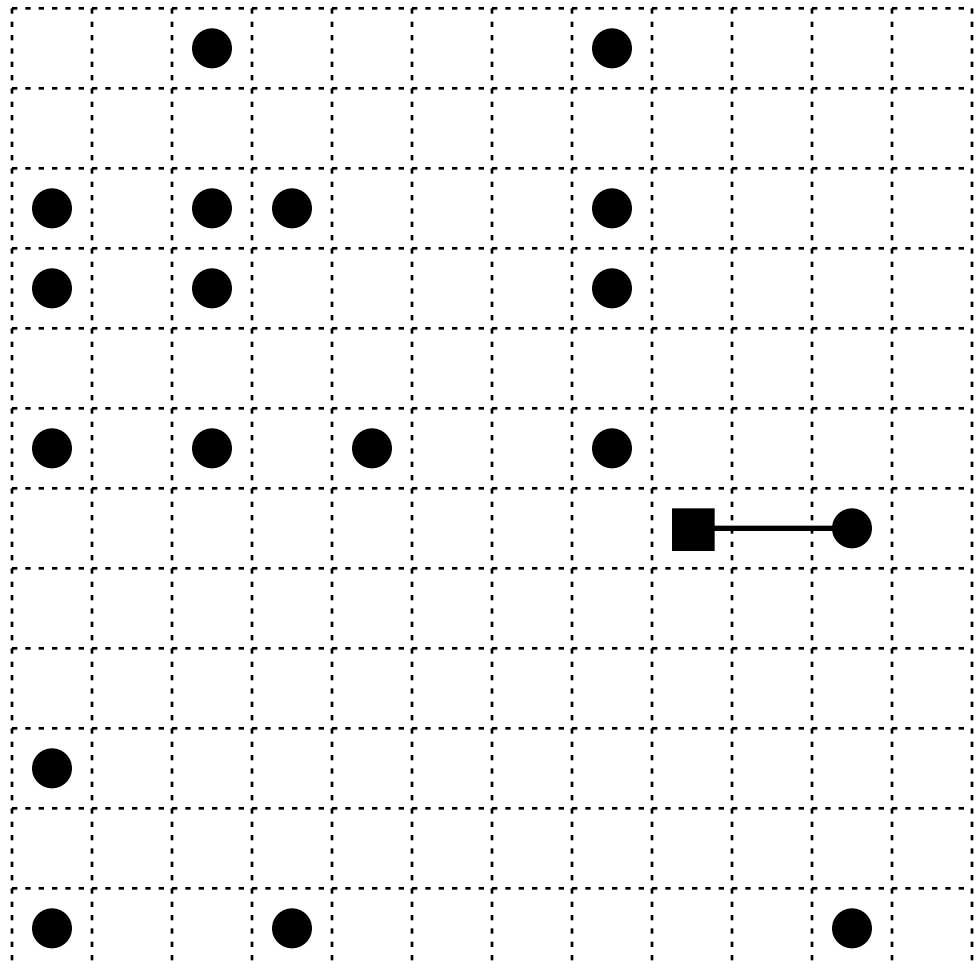


My Name: _____

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



Name: _____

A rectangle, whose perimeter is one hundred four feet, has a length that is twelve feet longer than its width. What is the area of the rectangle?

A rectangle, whose perimeter is one hundred sixteen feet, has a length that is twelve feet longer than its width. What are the dimensions of the rectangle?

A rectangle, whose perimeter is one hundred eighteen feet, has a length that is five feet longer than its width. What is the area of the rectangle?

A rectangle, whose perimeter is one hundred sixteen feet, has a length that is eight feet longer than its width. What are the dimensions of the rectangle?

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Name: _____

Get a fidget spinner! Spin it.

I needed to spin _____ time(s) to finish.

Estimate quickly the
difference.
 $7,420 - 2,690$

Round 78,732 to the
nearest hundred.

What is 50% of 1,470?

9, 16, 25, 36, 49, 64,
_____, 100, 121, 144,
169, 196

A, S, S, A, S, S, A, S,
_____, A, S, S

 $9 \times 10 + 2$

$t - 10 + t = 38$
What is the value of t ?

Simplify.

$$\frac{9,200}{20,700} =$$

Circle the least amount:

24%

0.30

 $\frac{8}{25}$

If $4x = 76$, then $x =$

 0.8×0.06

If $x = -5$ and $n = 42$ then
what is $6x - 13n - 2n =$?

Name: _____

Alexander has 3 liters of a mixture containing 70% of boric acid. How much water must be added to make the mixture 56% boric acid?

Hannah has 1 liter of 60% acid. How much water should she add to make a solution that is 6% acid?

Ryan works at the EdHelper Juice Company which makes fruit juice. The company's most popular fruit juice contains 26% real fruit juice and 74% non-fruit juice. How much non-fruit juice should be added to 13 liters of fruit juice to make their popular fruit juice?

Alexandra makes a mixture of lattes at the coffee house. The mixture must contain 38% coffee and the rest milk. If Alexandra has already made nineteen cups of coffee, how much milk is needed?

Name: _____

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: $6\frac{1}{4}$, $2\frac{2}{3}$, or $4\frac{1}{3}$.

The other three numbers have to all be DIFFERENT and must be from these: $8\frac{1}{2}$, $5\frac{3}{4}$, $9\frac{1}{2}$, or $\frac{1}{2}$.

	$9\frac{1}{2}$							
$\frac{1}{2}$	$24\frac{3}{4}$	$8\frac{1}{2}$	21		21	$8\frac{1}{2}$	$28\frac{1}{12}$	$4\frac{1}{3}$
	$6\frac{1}{4}$							
	22		21		$19\frac{1}{12}$		$24\frac{3}{4}$	$\frac{1}{2}$
							$6\frac{1}{4}$	
			$26\frac{5}{12}$		$20\frac{1}{12}$		22	
	30		$21\frac{1}{6}$		$21\frac{1}{6}$		21	
	$17\frac{5}{12}$		$21\frac{1}{6}$					

Name: _____

A large pipe and a smaller pipe are connected to a tank. The large pipe can empty the tank in seven minutes. The small pipe can empty the tank in twelve minutes. If both pipes are used at the same time, how long will it take to empty the tank?

Cameron can paint a room in ten hours. Jason can paint the same room in eleven hours. How long does it take for both Cameron and Jason to paint the room if they are working together?

Timothy can do the yard work in four hours. If Joshua helps him, they can do the yard work in $2\frac{2}{5}$ hours. How long would it take Joshua if he did all of the yard work?

Jessica works two times as fast as Joshua. If it takes them $1\frac{1}{3}$ hours to finish the job together, how long will it take Jessica to finish the job alone?

Name: _____

Alexander left New York and drove at a speed of 49 mph. Sean left 2 hours and 27 minutes later and drove at a speed of 59 mph. How long will it take Sean to catch up with Alexander?

A plane takes 9 hours and 32 minutes to fly from Boston to Pittsburgh and 8 hours and 27 minutes to fly back. The distance between Boston and Pittsburgh is 2,650 miles. If the plane flies at the same engine speed both ways, what is the wind velocity?

A plane takes 6 hours and 28 minutes to fly from 2 to 24 and 6 hours and 59 minutes to fly back. The wind velocity is 23 mph from 2 on both trips. What is the airspeed of the plane?

Morgan, who lives north of Jasmine, would like to meet with Jasmine as soon as possible. Morgan started driving south on Interstate 95 at fifty-six mph. Jasmine started driving north on interstate 95 at fifty-one mph. If they are 343 miles apart at 9:31, what time will they be able to meet?

Name: _____

What is 5% of 43?

Show the steps to solve $3(43 + 9 + 17) \times 13 - 93 \div 3$

Parentheses

Exponents

Multiplication & Division (or Division & Multiplication!)

Addition & Subtraction (or Subtraction & Division!)

Name: _____

	+		x	=	
	A	C	A		66
+	A	?	B		88
+	A	A	A		132
=					
	33	27	29		

Equations and Hints:

Each letter is a whole number.

Fill in the equations using the chart:

$$A + B + A = 29 \quad A + \underline{\quad} + A = 33 \quad \underline{\quad} + \underline{\quad} \times \underline{\quad} = 66$$

$$\underline{\quad} + \underline{\quad} \times \underline{\quad} = 132$$

Additional hints:

$$B = C + 2 \quad B > 4$$

Show Work:

Solve:

$$? = \underline{\quad}$$

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Name: _____

Holly has some one-foot square tiles she wants to put in her garden to use as stepping stones. Her garden is twenty feet long and twelve feet wide. She has twenty-seven tiles. What percent of the garden will be unavailable for planting once she places the tiles in it? Round your answer to the nearest tenth of a percent.

In your new ant collection (containing no endangered species of course) you have five ants. In deciding a way to arrange them on the display card, you wonder how many different ways there are to arrange five different ants all in a row. How many are there?

According to the statistics, the Megalopolis lacrosse team scores 30% of their goals in the first half of play and the rest during the second half. Thus, it seems that the coach's opinion that they are a "second half team" is correct. If they scored 12 goals in the first half this year, about how many did they score in the second half?

Ava donated ten percent of the money she earned this summer to her local fire department. If she donated a total of \$82 how much did she earn this summer?

Rose whined, "I don't understand all this technical stuff. The instructions say I should compress my files. How do I do that?" The instruction manual that came with the software had very clear instructions, but Rose liked being contrary, so she never read instructions. The software will compress a file to one-twelfth of its uncompressed size. If it is used to compress a file of 228,941 bytes, how many bytes will the new file take up?

Max plays shortstop for the Littleville baseball team. He is an excellent base runner. He is successful in stealing second base 86% of the time and successful stealing third base 69% of the time. He attempted to steal second 18 times and third 9 times last year. What fraction of his attempts failed?

Name: _____

In a chromatography column (basically a long thin tube), there is carbon dioxide flowing at a rate of 20 ml/min. If the maximum flow rate for the column is 152 ml/min, at what fraction of the maximum is the column currently operating? Express your answer as a fraction.

After a big storm, Mr. Bloop noticed that a lot of the sand from his volleyball pit had been blown away. He drove his pickup truck down to the local garden supply yard and purchased 5 truckloads of sand to add to the pit. His truck could carry 700 pounds of sand each time. The sand cost \$147 per ton. Originally, it took 16 pickup truck loads to fill the pit. What fraction of the sand had been blown away by the storm?

With the help of Mr. Bloop, some middle school students measured the growth rate of a fungus. An old fashioned (but still useful) apparatus called a race tube was used. A small piece of the fungus was placed at one end of a long tube that had a layer of growth medium filling it about half way. Then the distance the fungus grew down the tube was measured each day. At the end of four weeks the fungus had advanced 34 cm along the tube. What was the average speed of advance of the fungus in m/s? Express your answer using scientific notation.

Eric and Connor go to the mall parking lot on weekends to see if they can find any loose change. People tend to lose small amounts of money in the parking lot. Over the past year they have kept track of how much money they have found. They found fifteen quarters, three fifty-cent pieces, twenty-four dimes, thirty-six nickels, and two hundred two pennies. What is the probability that the next coin they find will be worth more than ten cents? State your answer as a percent to the nearest percent.

The Megalopolis soccer team won 27 games and lost 11 this year. What fraction of their games did they win?

A window takes up thirty-one percent of the area of a 32 inch by 63 inch door. What is the area of the window?

Page 1 Answers

- 1 640 square feet (20 feet wide by 32 feet long)
- 2 23 feet wide by 35 feet long
- 3 864 square feet (27 feet wide by 32 feet long)
- 4 25 feet wide by 33 feet long

Page 2 Answers

Page 3 Answers

- 1 $\frac{3}{4}$ liters
- 2 9 liters
- 3 37 liters
- 4 31 cups

Page 5 Answers

- 1 $4\frac{8}{19}$ minutes
- 2 $5\frac{5}{21}$ hours
- 3 6 hours
- 4 2 hours (it will take Joshua 4 hours)

Page 6 Answers

- 1 $\frac{1}{0}$ hours, or approximately 1 minute
- 2 36 mph towards Boston (note: velocity requires direction. Speed of flight: 278 mph and 314 mph)
- 3 287 mph (310 mph the other way)
- 4 12:43 p.m.



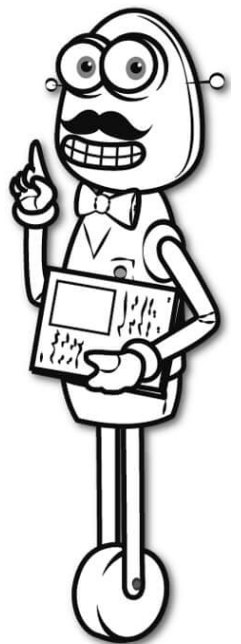
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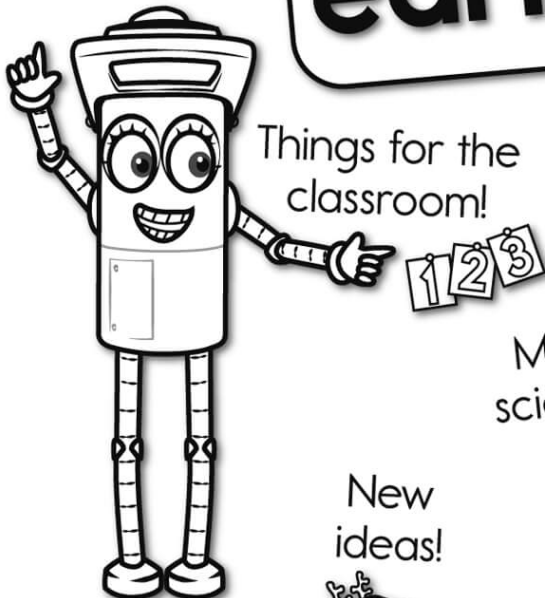
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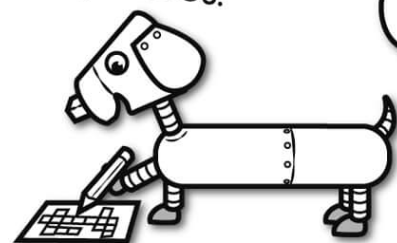


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