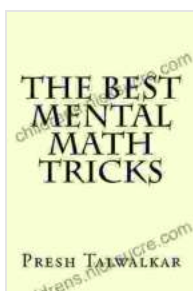


Unleash Your Cognitive Prowess: A Comprehensive Guide to the Best Mental Math Tricks

In the realm of cognitive enhancement, the pursuit of mental agility reigns supreme. Mental math, a formidable skill that empowers us to perform complex calculations swiftly and accurately, stands as a testament to our cognitive prowess.



The Best Mental Math Tricks by Presh Talwalkar

★★★★☆ 4.3 out of 5

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Embarking on this captivating journey into the world of mental math, we shall uncover a treasure trove of ingenious tricks and techniques that will unlock your cognitive potential and conquer numerical challenges effortlessly.

Prepare to witness the transformation of mundane numerical tasks into feats of mental mastery, as we delve into the intricacies of multiplying double-digit numbers in your head, estimating percentages with lightning speed, and even extracting square roots with remarkable ease.

Trick 1: Multiplication Magic with Double-Digit Numbers

2-digit Multiplication

Step 1: Multiply by the one's place

$$\begin{array}{r} 67 \\ \times 23 \\ \hline 201 \end{array}$$

Step 2: Put a zero to hold the one's place

$$\begin{array}{r} 67 \\ \times 23 \\ \hline 201 \\ 0 \end{array}$$

Step 3: Multiply by the ten's place

$$\begin{array}{r} 67 \\ \times 23 \\ \hline 201 \\ 1340 \end{array}$$

Step 4: Add the numbers

$$\begin{array}{r} 67 \\ \times 23 \\ \hline 201 \\ 1340 \\ \hline 1541 \end{array}$$

Multiplying double-digit numbers in your head may seem like a daunting task, but with this ingenious trick, you'll turn numerical gymnastics into a seamless dance.

1. Decompose the two-digit numbers into tens and ones: $A = 10a + b$ and $B = 10c + d$

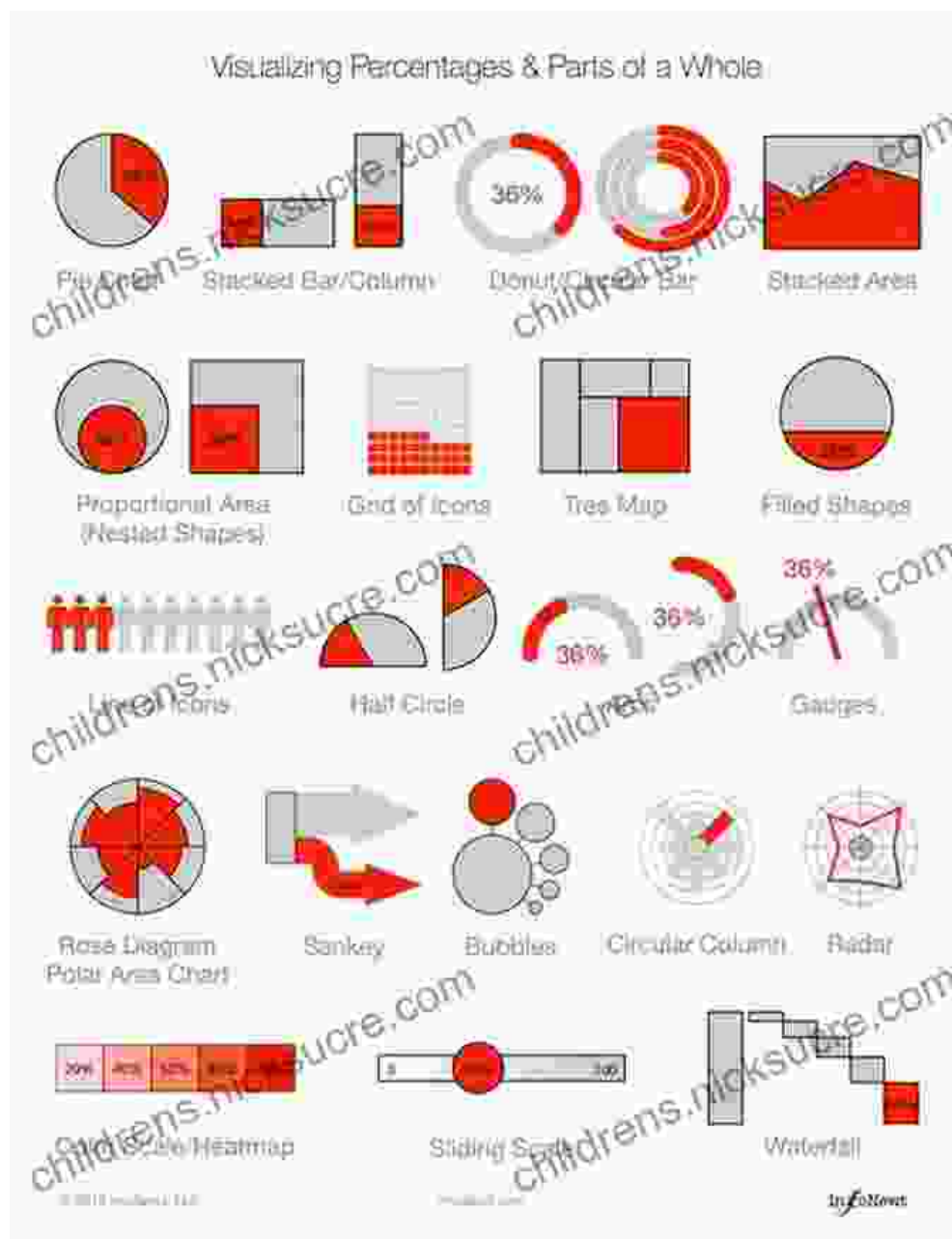
2. Multiply the tens digits: ac
3. Multiply the ones digits: bd
4. Add the products from steps 2 and 3: $ac + bd$
5. Multiply the tens digit of A by the ones digit of B and the ones digit of A by the tens digit of B, and add these products: $(a \times d) + (b \times c)$
6. Combine the results from steps 4 and 5: $(ac + bd) + (a \times d + b \times c)$
7. This final sum is your answer!

Let's put this trick into action: to multiply 23 by 34, we employ the following steps:

1. $23 = 20 + 3$ and $34 = 30 + 4$
2. $2 \times 3 = 6$
3. $3 \times 4 = 12$
4. $6 + 12 = 18$
5. $(2 \times 4) + (3 \times 3) = 8 + 9 = 17$
6. $18 + 17 = 35$

Voila! The answer is 35, swiftly and accurately computed without the aid of pen and paper.

Trick 2: Percentage Estimation in a Flash



Navigating the world of percentages often requires quick estimation skills. With this clever trick, you'll become a master of approximating percentages, enabling you to make informed decisions with lightning speed.

1. Round the percentage to the nearest 10%: If the percentage is between 0% and 10%, round it to 0%; between 11% and 20%, round it to 10%; and so on.

2. Multiply the number by the rounded percentage: For example, to estimate 15% of 120, we multiply 120 by 10%.
3. If the original percentage was higher than the rounded percentage, add a slight increase to the estimated value: In our example, 15% is slightly higher than 10%, so we add a few units to the estimated value.

Let's try estimating 15% of 120 using this trick:

1. 15% rounded to the nearest 10% is 10%.
2. 120 multiplied by 10% is 12.
3. Since 15% is slightly higher than 10%, we add a few units to the estimated value, giving us a final estimate of 13 or 14.

There you have it! You've just estimated 15% of 120 with astonishing speed.

Trick 3: Square Root Extraction with Ease

HOW TO EXTRACT SQUARE \sqrt ROOTS BY HAND

$\sqrt{15876} = 126$

	1
2	58
	44
24	1476
*	1476
	0

Extracting square roots has often been perceived as a complex task, but not anymore! This ingenious trick will empower you to conquer square roots with remarkable ease.

1. Pair the digits of the number starting from the decimal point: If the number has an odd number of digits, add a zero to the left.
2. Find the largest integer whose square is less than or equal to the first pair of digits.
3. Subtract the square of this integer from the first pair of digits.
4. Bring down the next pair of digits.
5. Double the integer found in step 2 and append a placeholder 0 to its right.

6. Find the largest integer that, when multiplied by the doubled integer from step 5, is less than or equal to the current dividend (the number formed by the first two steps).
7. Subtract the product of these two integers from the current dividend.
8. Bring down the next pair of digits.
9. Repeat steps 5 to 8 until all digits have been paired.

Let's extract the square root of 12345 using this method:

```
12 | 345 1 | 1 ---- 11 | 2345 110| 2200 22 | 145
```

Therefore, the square root of 12345 is approximately 111.

Trick 4: Mental Addition with Regrouping

Addition ~~with~~ Regrouping

Addition with regrouping is tricky to do.
 So here's a little rhyme to help you:
 Put your ones up,
 and your tens down low...

Add them all together, and you're ready to go!

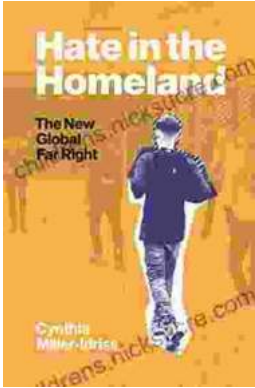
	1	
	4	5
+	1	8
	6	3

$$\begin{array}{r} 1 \\ 4 \\ + 1 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 5 \\ 8 \\ + 8 \\ \hline 13 \end{array}$$

Mental addition may seem straightforward, but when numbers get large, regrouping becomes essential. This trick will equip you with a foolproof method for regrouping in your head.

1. Start by adding the ones digits.



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