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Meine Forschermappe zu

 **Name:**

 **Bearbeitungszeitraum:**

 vom bis zum

**ANNA-Zahlen**



Aufgabe 1

Schau dir die Aufgaben genau an und rechne sie aus.

Finde möglichst viele weitere Aufgaben mit dem gleichen Muster und rechne sie aus.

Ordne die Karten auf einem großen Blatt Papier (DIN-A3) und klebe sie geordnet auf.

 22,5



**Wortspeicher**

*(Diese Worte kannst du benutzen!)*

* Ziffer
* Stelle
* Tausenderzahl
* Hunderterzahl
* Zehnerzahl
* Einerzahl

Aufgabe 2

Diese Aufgaben nennt man ANNA-Aufgaben.

Erkläre, warum diese Aufgaben so heißen und wie man ANNA-Aufgaben bildet.

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Aufgabe 3

Schreibe die Ergebniszahlen geordnet auf,

beginne mit dem kleinsten Ergebnis.

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Aufgabe 4

Was fällt dir auf, wenn du den Abstand der Ergebniszahlen miteinander vergleichst?

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Aufgabe 5

Nimm dir einige Ergebnisse von ANNA-Aufgaben und addiere jeweils die einzelnen Ziffern. Was fällt dir auf?

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Aufgabe 6 a)

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Wie viele ANNA-Aufgaben findest du mit der Differenz 8019? Schreibe die Aufgaben auf. Du musst nicht alle Felder verwenden.

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Aufgabe 6 b)

Warum gibt es nicht mehr Aufgaben mit der Differenz 8019?

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Aufgabe 6 c)

Für welche Differenz gibt es die meisten ANNA-Aufgaben? Warum ist das so?

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Aufgabe 7

Multipliziere den Ziffernabstand einer ANNA-Aufgabe mit 891. Was fällt dir auf? Teste mindestens zwei Aufgaben mit unterschiedlichen Ziffernabständen und schreibe sie auf.

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Aufgabe 8

Nimm dir ein Ergebnis einer ANNA-Aufgabe. Addiere die Zehnerziffer mit der Tausenderziffer. Nimm dir weitere Ergebnisse von ANNA-Aufgaben und verfahre genauso. Was fällt dir auf?

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Aufgabe 9

Du hast jetzt viele Entdeckungen gemacht. Kreuze an, ob die Aussagen richtig (r) oder falsch (f) sind. Schreibe am Ende zwei Aussagen selbst dazu, die zusätzlich bei ANNA-Aufgaben immer stimmen.

r

f

 Das kleinste Ergebnis ist 891.

r

f

 Zu jedem Ergebnis gibt es mehrere Aufgaben

r

f

 Von Ergebnis zu Ergebnis werden es immer 891 mehr.

r

f

 Die Ergebnisse sind wieder ANNA-Zahlen

r

f

Man findet weitere Aufgaben zu einer Ergebniszahl, wenn die Ziffern in der ANNA-Zahl den gleichen Unterschied haben.

r

f

 Wenn ich alle Ziffern einer Ergebniszahl addiere, beträgt die Summe 27.

r

f

 Es gibt insgesamt 10 verschiedene Ergebnisse bei ANNA-Aufgaben.

r

f

 Die Ergebnisse wachsen nicht immer um dieselbe Zahl.

r

f

 9

Zusatzaufgabe

In der Stellenwerttafel ist die Aufgabe 5445 – 4554 dargestellt. Bei einer Minusaufgabe geht es um den Unterschied zwischen zwei Zahlen. Aus 4554 wird 5445, indem ein Hunderter zu den Tausendern und ein Einer zu den Zehnern wandert.

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| --- | --- | --- | --- |
| Tausender | Hunderter | Zehner | Einer |
| **4554** |  |  |  |
| **+ 1000** | **- 100** | **- 10** | **+ 1** |
| **5445** |  |  |  |
| Insgesamt wird 4554 um 1000 – 100 - 10 + 1 = 891 größer. |

Zeichne 4664 in die Stellentafel und zeichne ein, wie 6446 entsteht.

|  |  |  |  |
| --- | --- | --- | --- |
| Tausender | Hunderter | Zehner | Einer |
| **4664** |  |  |  |
| **+ \_\_\_\_\_\_** | **- \_\_\_\_\_** | **+ \_\_\_\_\_** | **- \_\_\_\_\_** |
| **6446** |  |  |  |
| Insgesamt wird 4664 um \_\_\_­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ größer. |

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Beantworte mit Hilfe deiner Entdeckungen aus der Stellentafel die Frage, warum das Ergebnis immer ein Vielfaches von 891 ist.

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Du hast es geschafft! ☺

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Du hast \_\_\_\_\_\_ von 66,5 Punkten erreicht. **Note: \_\_\_\_\_\_\_\_\_\_**

Unterschrift Lehrkraft: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Unterschrift Eltern: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Erwartungshorizont für die Punktevergabe**

**Aufgabe 1:**

* Je ½ Punkt pro korrekt bearbeiteter Aufgabe. (22.5 Punkte)

**Aufgabe 2:**

* Jede Ziffer entspricht einem Buchstaben. (2 Punkte)
* Die zweite Zahl (Umkehrzahl) ist auch eine NANA-Zahl. Sie wird gebildet, indem die Einer- und Hunderterziffer in der zweiten Zahl die Plätze mit der Zehner- und Tausenderziffer tauschen. (2 Punkte)
* Es muss immer die kleinere Zahl von der größeren abgezogen werden. (2 Punkte)

**Aufgabe 3:**

* Ein Punkt pro richtiger Ergebniszahl (ins. 9 Punkte)

**Aufgabe 4:**

* Der Abstand zwischen zwei benachbarten Ergebniszahlen beträgt immer 891. (2 Punkte)

**Aufgabe 5:**

* Die Summe der einzelnen Ziffern einer Ergebniszahl ist immer 18. (2 Punkte)

**Aufgabe 6a:**

* Für die und nur die Aufgabe (9009-990) mit 8019 als größter Differenz. (2 Punkte)

**Aufgabe 6b:**

* Größte mögliche ANNA-Zahl minus die kleinste mögliche ANNA-Zahl. (2 Punkte)
* Ziffernabstand innerhalb der Stellenwerte ist maximal. (evtl. 2 Extra-Punkte)

**Aufgabe 6c:**

* Ergebnis 891 (2 Punkte)
* Weil es für den Ziffernabstand 1 die meisten Ziffernpaare gibt, aus denen sich ANNA-Aufgaben bilden lassen. (2 Punkte)

**Aufgabe 7:**

* 2 Punkte für jede der beiden Multiplikationsaufgaben (4 Punkte)
* Erkenntnis, dass das Produkt aus Ziffernabstand und 891 der Differenz der ANNA-Aufgabe entspricht. (2 Punkte)

**Aufgabe 8:**

* Immer 9 als Ergebnis (2 Punkte)

**Aufgabe 9:**

* Pro richtiger Markierung bzw. Aussage ein Punkt (insgesamt 9 Punkte)

**Zusatzaufgabe** *(diese Punkte zählen nicht zur Rohpunktzahl)***:**

* Korrektes Einzeichnen der Aufgabe 6446-4664. (4 Punkte)
* Bei der zweiten Aufgabe werden immer zwei Plättchen verschoben, dadurch ist die Differenz 2 mal 891. (2 Punkte)
* Bei allen anderen Aufgaben ist das genauso. Immer wird eine bestimmte Anzahl von Plättchen verschoben, die mit 891 multipliziert wird und so das Ergebnis bildet. (2 Punkte)