

Differenzen und Quotienten von Restklassen

Aufgabe 3

a) Bestimme in \mathbb{Z}_9 : $[1] - [8] = \boxed{}$ und $-[4] = \boxed{}$.

b) Bestimme in \mathbb{Z}_{11} die Restklassen der angegebenen Brüche. Lies die Ergebnisse in der unten stehenden Multiplikationstabelle ab und begründe jeweils Dein Ergebnis.

b₁) $\frac{[1]}{[2]} = \boxed{}$, denn $[2] \cdot \boxed{} = \boxed{}$.

b₂) $\frac{[1]}{[4]} = \boxed{}$, denn $\boxed{}$

b₃) $\frac{[2]}{[4]} = \boxed{}$, denn $\boxed{}$

Für die Lösung dieser Aufgabe kannst du die folgenden Verknüpfungstabellen verwenden.

Addition in \mathbb{Z}_9

+	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
[0]	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
[1]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[0]
[2]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[0]	[1]
[3]	[3]	[4]	[5]	[6]	[7]	[8]	[0]	[1]	[2]
[4]	[4]	[5]	[6]	[7]	[8]	[0]	[1]	[2]	[3]
[5]	[5]	[6]	[7]	[8]	[0]	[1]	[2]	[3]	[4]
[6]	[6]	[7]	[8]	[0]	[1]	[2]	[3]	[4]	[5]
[7]	[7]	[8]	[0]	[1]	[2]	[3]	[4]	[5]	[6]
[8]	[8]	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]

Multiplikation in \mathbb{Z}_{11}

·	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
[1]	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
[2]	[0]	[2]	[4]	[6]	[8]	[10]	[1]	[3]	[5]	[7]	[9]
[3]	[0]	[3]	[6]	[9]	[1]	[4]	[7]	[10]	[2]	[5]	[8]
[4]	[0]	[4]	[8]	[1]	[5]	[9]	[2]	[6]	[10]	[3]	[7]
[5]	[0]	[5]	[10]	[4]	[9]	[3]	[8]	[2]	[7]	[1]	[6]
[6]	[0]	[6]	[1]	[7]	[2]	[8]	[3]	[9]	[4]	[10]	[5]
[7]	[0]	[7]	[3]	[10]	[6]	[2]	[9]	[5]	[1]	[8]	[4]
[8]	[0]	[8]	[5]	[2]	[10]	[7]	[4]	[1]	[9]	[6]	[3]
[9]	[0]	[9]	[7]	[5]	[3]	[1]	[10]	[8]	[6]	[4]	[2]
[10]	[0]	[10]	[9]	[8]	[7]	[6]	[5]	[4]	[3]	[2]	[1]

Aufgabe 4

a) Fülle die Verknüpfungstabelle für die Multiplikation in \mathbb{Z}_4 aus.

\cdot	[0]	[1]	[2]	[3]
[0]	[]	[]	[]	[]
[1]	[]	[]	[]	[]
[2]	[]	[]	[]	[]
[3]	[]	[]	[]	[]

b) Versuche, in \mathbb{Z}_4 die Restklassen folgender Brüche zu bestimmen.

$$\frac{[1]}{[3]}$$

$$\frac{[1]}{[2]}$$

$$\frac{[2]}{[2]}$$