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| Station  „M² - Mathe auf dem Maimarkt“  Teil 2  Arbeitsheft   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | | Teilnehmercode | | | | | | | | |

Liebe Schülerinnen und Schüler!

in dieser Station plant ihr einen Maimarkt. Hierfür bearbeitet ihr in drei Teilstationen verschiedene Aufgaben.

In diesem Teil geht es um den Aufbauplan des Maimarktes und die damit verbundenen Wege. Außerdem begleitet ihr die Freunde Anna, Markus und Lena zu einigen Attraktionen auf dem Maimarkt und helft ihnen bei ihren Entscheidungen.

Bevor ihr anfangen könnt, beachtet bitte folgenden Hinweis:

Flächen und Längen in den Abbildungen sind nicht maßstabsgetreu.

Wichtig: Bearbeitet bitte alle Aufgaben der Reihe nach!



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|  | Zu dieser Aufgabe gibt es Hilfen im Hilfeheft. |
|  | Diskutiert hier eure wichtigsten Ergebnisse und fasst sie zusammen. |
|  | Zu dieser Aufgabe gibt es eine Simulation oder ein Video. |
|  | Zu dieser Aufgabe gibt es Material auf eurem Tisch. |

Wir wünschen Euch viel Spaß beim Experimentieren und Entdecken!

Das Mathematik-Labor-Team

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| Material 1 + Material 3 + Material 4   * weißes Magnetbrett * Aufbauplan des Maimarktes * Wegstücke  |  |  | | --- | --- | | Farbe | Variable | | Lila | l | | Weiß | w | | Schwarz-Weiß | s | | WhatsApp Image 2018-03-07 at 21.12.14.jpeg |

Der Besitzer des Maimarkts hat eine Skizze erstellt auf der die Anordnung der Attraktionen abgebildet ist. Nun möchte er wissen wie lang der Weg ist, den die Besucher zurücklegen müssen, um an allen Attraktionen vorbei zu kommen.

In Material 3 und Material 4 findet ihr den Aufbauplan des Maimarktes und verschiedene Weglängen.

* 1. Legt die Auflage auf das Magnetbrett. Erstellt mit den Wegstücken einen Rundweg der an allen Eingängen der Attraktionen vorbeiführt. Verwendet dafür so viele Magnetstreifen wie ihr möchtet. Die Eingänge der Attraktionen sind mit folgendem Symbol gekennzeichnet:

1.2 Stellt einen Term für die gesamte Länge eures Weges auf. Geht dabei Schritt für Schritt vor, so dass ihr keinen Teil des Weges vergesst.

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2.1 Öffnet Simulation 2 und erklärt die wesentlichen Schritte, die in der Simulation dargestellt werden.

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2.2 Bearbeitet Simulation 3. Korrigiert die Terme, die nicht richtig vereinfacht wurden, hier.

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2.3 Vereinfacht nun euren Term aus Aufgabe 1.2, wie es euch in Simulation 2 gezeigt wurde.

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2.4 Die Weglängen hat der Betreiber nun gemessen. Berechnet euren Weg, in dem ihr die Variablen aus 2.3 durch die Werte ersetzt.

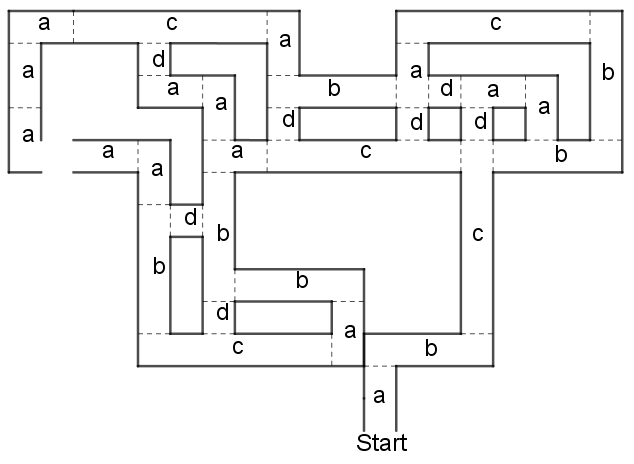
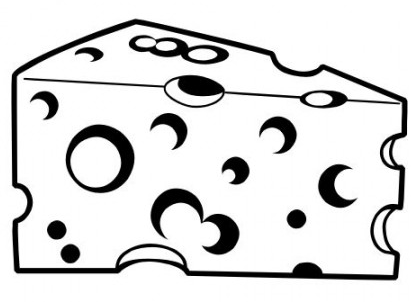
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| Farbe | Länge [m] |
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| Weiß | 3 |
| Schwarz-Weiß | 2 |

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Auf dem Maimarkt findet ein Mäuserennen statt. Gewonnen hat die Maus, die als schnellstes beim Käse angekommen ist. Die Freunde Anna und Markus haben vor beim nächsten Rennen auf eine Maus zu wetten. Beide haben die Mäuse, die beim nächsten Rennen starten, zuvor aufmerksam beobachtet und dabei festgestellt:

* Maus 1 biegt aus ihrer Sicht am liebsten nach rechts ab und biegt nur nach links ab, wenn ihr keine andere Wahl bleibt
* Maus 2 biegt aus ihrer Sicht am liebsten nach links ab und biegt nur nach rechts ab, wenn ihr keine andere Wahl bleibt

Folgende Skizze der Rennstrecke haben die Freunde beim Betreiber entdeckt.



3.1 Zeichnet für beide Mäuse ihren gelaufenen Weg in das Labyrinth ein und stellt für diese beiden Wege im Anschluss einen Term auf.

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3.2 Die beiden Freunde möchten die Terme miteinander vergleichen. Vereinfacht daher nun beide Terme, um den Freunden den Vergleich zu erleichtern.

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3.3 Auf welche Maus sollen die Freunde wetten, wenn beide Mäuse genau gleich schnell laufen? Begründet eure Antwort.

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3.4 Bringt die Satzteile in die richtige Reihenfolge und schreibt den Merksatz zum **Kommutativgesetz** auf.

**L**

**E**

**K**

**Das Kommutativgesetz**

**beliebig zu**

**der Faktoren**

**S**

**A**

**R**

**Produkten die Reihenfolge**

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**bei Summen die**

**U**

**Summanden und bei**

**L**

**S**

**die Reihenfolge der**

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Habt ihr die Bausteine richtig geordnet erhaltet ihr mit den zugehörigen Buchstaben ein Lösungswort:

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Der Besitzer des Limonadenstandes bietet verschiedene Fruchtsäfte (Orangensaft, Apfelsaft und Ananassaft) zu unterschiedlichen Preisen an.

0,25 Liter Orangensaft 1,0 € a

0,25 Liter Apfelsaft 0,9 € b

0,25 Liter Ananassaft 1,1 € c

Am Vormittag kauft sich Anna einen Orangensaft und einen Apfelsaft. Lena kauft sich stattdessen einen Apfelsaft und einen Ananassaft.

4.1 Stellt für beide Mädchen einen Term für ihre Getränkekosten auf und berechnet im Anschluss was beide Mädchen bezahlen müssen.

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Am Nachmittag haben die Mädchen erneut Durst. Jetzt kauft sich Anna einen Ananassaft und Lena einen Orangensaft.



4.2 Ergänzt eure Terme aus Aufgabe 4.1. Überlegt wie ihr durch Rechenzeichen deutlich machen könnt, welche Säfte von den Mädchen zuerst gekauft wurden und welcher Saft jetzt neu dazugekommen ist.

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4.3 Berechnet wie viel Geld die beiden Mädchen insgesamt für Getränke ausgegeben haben. Was fällt euch auf, wenn ihr die beiden Ergebnisse miteinander vergleicht? (Macht die Reihenfolge der Addition der Säfte einen Unterschied aus?)

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4.4 Bringt die Satzteile in die richtige Reihenfolge und schreibt den Merksatz zum **Assoziativgesetz** auf.

**M**

**I**

**S**

**Summanden und Produkten mit**

**SK**

**B**

**Klammern beliebig zu setzen.**

**erlaubt es bei Summen**

**mit mehr als zwei**

**mehr als zwei Faktoren**

**I**

**Das Assoziativgesetz**

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Hast du die Bausteine richtig geordnet, erhältst du mit den zugehörigen Buchstaben ein Lösungswort:

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Auf dem Maimarkt befinden sich zwei Glücksräder. Beide Glücksräder enthalten Felder in verschiedenen Farben. Ein Spieler entscheidet sich vor dem Spiel für eine Farbe und wählt einen beliebigen Geldbetrag als Einsatz aus. Wenn das erste Glücksrad seine ausgewählte Farbe zeigt verdreifacht sich der Einsatz des Spielers. Sofern auch das zweite Glücksrad seine Farbe zeigt wird von seinem Einsatz 1€ abgezogen und diese Zahl wird dann verdoppelt. Am Ende werden die Gewinne beider Glücksräder multipliziert.



5.1 Stellt in Abhängigkeit des unbekannten Einsatzes einen Term für den Gewinn auf, wenn beide Glücksräder die ausgewählte Farbe zeigen.

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5.2 Vereinfacht euren Term aus Aufgabe 5.1.

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5.3 Markus wählt als Einsatz 4 €. Berechnet welchen Betrag Markus gewinnen würde, wenn die Glückräder beide die ausgewählte Farbe zeigen.

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Variante B

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