**Representing Relations I**

A *relation* is a connection between an input and an output**.** Relations can be expressed in five different ways: mapping diagrams, tables, ordered pairs, graphs, and equations. However, not all relations are easily expressed using all five methods. The following table shows artists, their average ticket price and their gross income for the tour. Use the data to express the relations in various ways.

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| **2011 Top Concert Tours**   |  |  |  | | --- | --- | --- | | **Artist** | **Ticket  Price** | **Income (in millions)** | | U2 | 97 | 232 | | Bon Jovi | 94 | 149 | | Taylor Swift | 71 | 104 | | Elton John | 120 | 103 | | Rihanna | 75 | 90 | | Kenny Chesney | 73 | 85 |   *Source: Pollstar* | | 1. **Mapping Diagram**   (Ticket Price, Income in millions)  Ticket Price Income   |  |  |  | | --- | --- | --- | | 97 |  | 103 | | 94 |  | 104 | | 71 |  | 149 | | 120 |  | 90 | | 75 |  | 85 | | 73 |  | 232 | |
| A relation can also describe a connection between things that aren’t numbers, like the artist and the income for the tour, or the artist and the stage manager. | | |
| 1. **Ordered Pairs**   (Artist, Income in millions)  ( \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_ )  ( \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_ )  ( \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_ )  ( \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_ )  ( \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_ )  ( \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_ )  ( \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_ ) | 1. **Graph** (Ticket Price, Income in millions)   **C:\Users\TRAVEL\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\BAUHNN9G\ticket price.png** | |

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| 1. Map five students to their English teacher   **Student English Teacher**   |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  |  1. Make tables for the relations above.  |  |  | | --- | --- | | **Student** | **English Teacher** | |  |  | |  |  | |  |  | |  |  | |  |  | | 5. Map a number of siblings to five students  **# of Siblings Student**   |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  |  |  |  | | --- | --- | | **# of Siblings** | **Student** | |  |  | |  |  | |  |  | |  |  | |  |  | | |
| 1. List ordered pairs with famous athletes as the inputs and the sports they play as the outputs.   ( \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ )  ( \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ )  ( \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ) | | |
| 1. List three ordered pairs on the graph below.   C:\Users\TRAVEL\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\G5RXD1SG\Books 3.png | | Input: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Output: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  ( \_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_ )  ( \_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_ )  ( \_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_ ) |

1. Which of the relations in 1–8 are functions? Which are not? Explain.