

Babylonian Maths



Division - the Babylonian way

The Babylonians did not have a method for doing division directly, but they could do division by multiplying a number by its inverse - which is what we do when we want to divide by a fraction. What are the inverses of these numbers?

- | | |
|------------------|-------------------|
| 1. 2 | 5. $\frac{3}{4}$ |
| 2. 5 | 6. 0.3 |
| 3. $\frac{1}{3}$ | 7. $1\frac{2}{3}$ |
| 4. 0.5 | 8. 2.5 |

Choose three numbers and find their inverses. What do you get when you multiply a number by its inverse?

It is this rule that helped the Babylonians to divide. Suppose they wanted to calculate $120 \div 30$. These are the steps they would use:

- | | |
|--|---|
| 1. Find the inverse of 30, using the fact that when you multiply 30 by its inverse, you get 1. | $30 \times ? = 1$? would be $\frac{1}{30}$ in base 10. In base 60, it is 0;2, since $\frac{1}{30} = \frac{2}{60}$ |
| 2. They would then work out $120 \times 0;2$ | $120 \times 0;2 = 0;240 = 4$ or $120 \times \frac{2}{60} = \frac{240}{60} = 4$ |

In reality, Babylonian scribes memorised tablets with standard multiplication tables on them and tablets with lists of inverses to make things easier. Not surprising, really!

Complete this table of numbers and inverses.

| Number (base 60) | Number (base 10) | Inverse (base 10) | Inverse (base 60) | Number (base 60) | Number (base 10) | Inverse (base 10) | Inverse (base 60) |
|------------------|------------------|-------------------|-------------------|------------------|------------------|-------------------|-------------------|
| 0;30 | | | | | | | 0;03 |
| | 30 | | | | | 15 | |
| | | 1/60 | | | 1 1/2 | | |

Can you find a number in base 10 which would not have an exact inverse in base 60?

Babylonian Maths: Division

<http://motivate.maths.org/content/BabylonianMaths>

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