Long multiplication

Study Development Worksheet

## Example

What is 345 67?

## Answer

We begin by placing the numbers into the long multiplication style grids:

|  |  |  |  |
| --- | --- | --- | --- |
|  | 300 | 40 | 5 |
| 60 |  |  |  |
| 7 |  |  |  |

We then fill in the squares:

|  |  |  |  |
| --- | --- | --- | --- |
|  | 300 | 40 | 5 |
| 60 | 18,000 | 2,400 | 300 |
| 7 | 2,100 | 280 | 35 |

Finally, we sum the numbers in the squares:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 1 | 8 | 0 | 0 | 0 |
|  |  | 2 | 4 | 0 | 0 |
|  |  | 2 | 1 | 0 | 0 |
|  |  |  | 3 | 0 | 0 |
|  |  |  | 2 | 8 | 0 |
| + |  |  |  | 3 | 5 |
|  | 2 | 3 | 1 | 1 | 5 |
|  | ~~1~~ | ~~1~~ | ~~1~~ |  |  |

Therefore, we have found that 345 67 = 23,115

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## Questions

1. What is 32 17?
2. What is 24 4 9?
3. What is the area of a rectangle with sides of length 13 and 55?
4. What is 109 12.5?
5. What is 580 165?

Long multiplication

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## Answers

1. Begin by setting up the grid:

|  |  |  |
| --- | --- | --- |
|  | 30 | 2 |
| 10 |  |  |
| 7 |  |  |

Fill in the squares:

|  |  |  |
| --- | --- | --- |
|  | 30 | 2 |
| 10 | 300 | 20 |
| 7 | 210 | 14 |

Sum these values:

|  |  |  |  |
| --- | --- | --- | --- |
|  | 3 | 0 | 0 |
|  | 2 | 1 | 0 |
|  |  | 2 | 0 |
| + |  | 1 | 4 |
|  | 5 | 4 | 4 |
|  |  |  |  |

So, we have found that 32 17 = 544.

Long multiplication

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1. We will do this calculation in two steps. Begin by setting up the first grid:

|  |  |  |
| --- | --- | --- |
|  | 20 | 4 |
| 4 |  |  |

Fill in the blank squares:

|  |  |  |
| --- | --- | --- |
|  | 20 | 4 |
| 4 | 80 | 16 |

Add the values you have found:

|  |  |  |
| --- | --- | --- |
|  | 8 | 0 |
| + | 1 | 6 |
|  | 9 | 6 |

Now, we use this value for our second table:

|  |  |  |
| --- | --- | --- |
|  | 90 | 6 |
| 9 |  |  |

Fill in the blank squares:

|  |  |  |
| --- | --- | --- |
|  | 90 | 6 |
| 9 | 810 | 54 |

Add these values:

|  |  |  |  |
| --- | --- | --- | --- |
|  | 8 | 1 | 0 |
| + |  | 5 | 4 |
|  | 8 | 6 | 4 |

Therefore, we have found that 24 4 9 = 864.

Long multiplication

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1. The area of a rectangle is equal to its longer side length multiplied by its shorter side length. So, we want to calculate 13 55. Again, we set up the grid and fill in the blank squares:

|  |  |  |
| --- | --- | --- |
|  | 10 | 3 |
| 50 | 500 | 150 |
| 5 | 50 | 15 |

The sum of these values is:

|  |  |  |  |
| --- | --- | --- | --- |
|  | 5 | 0 | 0 |
|  | 1 | 5 | 0 |
|  |  | 5 | 0 |
| + |  | 1 | 5 |
|  | 7 | 1 | 5 |
|  | ~~1~~ |  |  |

Therefore, the area of the rectangle is 715 (units2).

Long multiplication

Study Development Worksheet

1. Set up the grid:

|  |  |  |
| --- | --- | --- |
|  | 100 | 9 |
| 10 |  |  |
| 2 |  |  |
| 0.5 |  |  |

Fill in the blank squares:

|  |  |  |
| --- | --- | --- |
|  | 100 | 9 |
| 10 | 1000 | 90 |
| 2 | 200 | 18 |
| 0.5 | 50 | 4.5 |

Sum these values:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 0 | 0 | 0 | . | 0 |
|  |  | 2 | 0 | 0 | . | 0 |
|  |  |  | 9 | 0 | . | 0 |
|  |  |  | 5 | 0 | . | 0 |
|  |  |  | 1 | 8 | . | 0 |
| + |  |  |  | 4 | . | 5 |
|  | 1 | 3 | 6 | 2 | . | 5 |
|  |  | ~~1~~ | ~~1~~ |  |  |  |

Therefore, we have that 109 12.5 = 1,362.5

Long multiplication

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1. Set up the grid and fill in the blanks:

|  |  |  |
| --- | --- | --- |
|  | 500 | 80 |
| 100 | 50,000 | 8,000 |
| 60 | 30,000 | 4,800 |
| 5 | 2,500 | 400 |

Add up the values:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 5 | 0 | 0 | 0 | 0 |
|  | 3 | 0 | 0 | 0 | 0 |
|  |  | 8 | 0 | 0 | 0 |
|  |  | 4 | 8 | 0 | 0 |
|  |  | 2 | 5 | 0 | 0 |
|  |  |  | 4 | 0 | 0 |
|  | 9 | 5 | 7 | 0 | 0 |
|  | ~~1~~ | ~~1~~ |  |  |  |

So, we have found that 580 165 = 95,700.

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