Each section is levelled to help you make progress. Only work on a section if you need to practise it (practice makes perfect). Use a calculator to check.

1. Adding Single-Digit Numbers

Using a number line can help. Adding always makes us jump to the right ().

|  |  |
| --- | --- |
| e.g. 7 + 5 = 12 | 0  1  2  3  4  5  6  7  8  9  10  11  12  13  14  15 |

Start at 7. Now jump 5 places to the right (→). We end up at 12!

Now try these.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. 3 + 6 = | 1. 2 + 7 = | 1. 4 + 5 = | 1. 2 + 5 = | 1. 5 + 3 = |
| 1. 4 + 7 = | 1. 6 + 5 = | 1. 3 + 8 = | 1. 7 + 6 = | 1. 8 + 7 = |

1. Adding Double-Digit Numbers

Here we have to learn to add up in columns. A number line can help.

|  |  |  |  |
| --- | --- | --- | --- |
| eg | T U |  |  |
|  | 3 7 |  | We always start from the right (dotted line). |
|  | 21 5 |  | 7 + 5 = 12. We think of this 12 as 10 + 2. So 2 goes into U |
|  | 6 2 |  | column and we carry the ‘1’ into the T column (doorstep). |
|  |  |  | Now 3 + 2 + 1 = 6 (in the T column). |

Now try these.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1.** | T U  2 6  3 5 + | **2.** | T U  3 8  2 4 + | **3.** | T U  4 3  3 9 + | **4.** | T U  5 8  2 3 + | **5.** | T U  4 6  2 7 + |
| **6.** | 6 3  2 9 + | **7.** | 2 9  2 9 + | **8.** | 6 7  2 4 + | **9.** | 5 6  4 5 + | **10.** | 7 2  2 9 + |
|  |  |  |  |  |  |  |  |  |  |

1. **Adding** Treble**-Digit Numbers**

We continue to add the numbers from the right carrying over any ‘1’s onto the doorstep.

e.g. H T U 4 + 9 = 13. Put the 3 down in U column and carry the ‘1’ into

3 5 4 T column.

11 61 9 + Now 5 + 6 + 1 = 12. Put the 2 down in T column and carry

5 2 3 the ‘1’ into the H column.

Finally 3 + 1 + 1 = 5 (in the H column).

Now try these.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1.** | H T U  2 6 4  3 2 8 + | **2.** | H T U  3 4 8  2 4 5 + | **3.** | H T U  1 4 3  2 3 9 + | **4.** | H T U  3 5 8  2 3 3 + | **5.** | H T U  5 4 6  2 3 7 + |
| **6.** | 6 3 7  2 9 5 + | **7.** | 2 9 5  4 3 9 + | **8.** | 2 6 7  3 7 4 + | **9.** | 5 6 3  4 5 9 + | **10.** | 7 8 2  2 9 9 + |
|  |  |  |  |  |  |  |  |  |  |

1. **Subtracting Single-Digit Numbers**

A number line can help. Subtracting always makes us jump to the left (→).

|  |  |
| --- | --- |
| e.g. 7 - 5 = **2** | 0  1  2  3  4  5  6  7  8  9  10  11  12  13  14  15 |

Start at 7. Now jump 5 places to the left (←). We end up at 2!

Now try these

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1.** | 9 - 6 = | **2.** | 9 - 4 = | **3.** | 8 - 5 = | **4.** | 7 - 3 = | **5.** | 9 - 7 = |
|  |  |  |  |  |  |  |  |  |  |
| **6.** | 8 - 7 = | **7.** | 6 - 4 = | **8.** | 9 - 8 = | **9.** | 10 - 6 = | **10.** | 12 - 5 = |

We can do subtraction by counting back (adding).

|  |  |
| --- | --- |
| 7 – 5 = **2** | Start at 5. Now jump 2 places to the right (→) until we end at 7. |

**5a. Subtracting Double-Digit Numbers (No borrow)**

We continue to add the numbers from the right carrying over any ‘1’s onto the doorstep.

|  |  |  |  |
| --- | --- | --- | --- |
| eg | **T U** |  | We always start from the right (dotted line). |
|  | 5 8 |  | 8 – 6 = 2. We put the 2 into **U** column. |
|  | 2 6- |  | Now 5 – 2 = **3** (in the **T** column). |
|  | 3 2 |  |  |
|  |  |  |  |

Now try these.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1.** | T U  5 6  3 5 - | **2.** | T U  3 8  2 4 - | **3.** | T U  4 7  1 2 - | **4.** | T U  5 8  2 3 - | **5.** | T U  4 9  2 7 - |
| **6.** | 6 5  2 2 - | **7.** | 7 9  2 6 - | **8.** | 9 7  2 4 - | **9.** | 8 6  4 5 - | **10.** | 7 8  3 1 - |
|  |  |  |  |  |  |  |  |  |  |

1. **Subtracting Double-Digit Numbers (‘Borrow 1’)**

|  |  |  |  |
| --- | --- | --- | --- |
| eg | **T U** |  | Starting with **U**. 3 – 6 we can’t do. |
|  | 56 3 |  | We borrow ‘a ten’ (‘1’) from the 6(**T**) by changing the 60 into |
|  | 2 6- |  | 50 + 10. Now we have 13 – 6 = **7** (in the **U** column). |
|  | 3 7 |  | Finally 5 – 2 = **3** (in the **T** column). |
|  |  |  |  |

Now try these.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1.** | T U  6 2  3 5 - | **2.** | T U  4 2  2 7 - | **3.** | T U  7 3  3 5 - | **4.** | T U  7 4  2 9 - | **5.** | T U  4 3  2 7 - |
| **6.** | 6 1  2 5 - | **7.** | 7 2  4 6 - | **8.** | 9 3  5 7 - | **9.** | 8 1  4 5 - | **10.** | 8 3  3 8 - |
|  |  |  |  |  |  |  |  |  |  |

Subtraction can be done by counting backwards using a number line.

|  |  |
| --- | --- |
| Always count up to nearest ‘10’. Finally add up… 4 + 30 + 3 = **37** | 26  30  60  63  30  4  3 |

1. **Subtracting numbers with zeros (‘Borrow 1’)**

We continue to add the numbers from the right carrying over any ‘1’s onto the doorstep.

|  |  |  |  |
| --- | --- | --- | --- |
| eg | **H T U** |  | Starting with **U**. 3 – 5 we can’t do. We can’t borrow from the 0(**T**) so we |
|  | 34 90 13 |  | borrow a ten’ (‘1’) from the 4(**H**) by changing 400 into 300 + 90 + 10. Now |
|  | 2 6 5 - |  | we have 13 – 5 = 8 (**U** column). Next we have 9 – 6 = 3 (**T column**) and |
|  | 1 3 8 |  | finally 3 – 2 = 1 (**H**) |
|  |  |  |  |

“All zeros (0) change to nines (9) and the final ten (‘1’) is added to the (U)”

|  |  |  |  |
| --- | --- | --- | --- |
| eg | 01 90 90 90 90 90 10 | | |
|  | 4 1 0 7 8 5 - | | |
|  | 5 8 9 2 1 5 | | |
|  |  |  |  |

Now try these.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1.** | H T U  6 0 0  3 5 8 - | **2.** | H T U  4 0 0  2 7 4 - | **3.** | H T U  7 0 0  3 5 9 - | **4.** | H T U  4 0 0  2 9 8 - | **5.** | H T U  8 0 0  3 7 9 - |
| **6.** | 6 0 0  2 5 9 - | **7.** | 7 0 0  4 6 3 - | **8.** | 1 0 0 0  5 7 4 - | **9.** | 1 0 0 0  7 2 8 - | **10.** | 3 0 0 0  1 5 7 4 - |
|  |  |  |  |  |  |  |  |  |  |

**6a. Multiplying two-digit numbers by single digit numbers**

Here we can use the ‘GRID’ or Farmers Field Method.

e.g. 37 × 6 = 222

|  |  |  |  |
| --- | --- | --- | --- |
| x | 3**0** | 7 | We split 37 into 3**0** and 7. These two go into column headings |
| 6 | 18**0** | 42 | and the 6 goes into the row heading. 3**0** x 6 = 18**0** and |
| 180 + 42 = 222 | | | 7 x 6 = 42.  Finally we add these to get the answer. |

Now try these.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1.** | 24 × 3 = | **2.** | 43 × 4 = | **3.** | 53 × 6 = | **4.** | 72 × 4 = | **5.** | 64 × 5 = |
| **6.** | 27 × 8 = | **7.** | 54 × 6 = | **8.** | 29 × 9 = | **9.** | 83 × 6 = | **10.** | 58 × 7 = |

**6b. Multiplying three-digit numbers by two-digit numbers**

We just extend the grid method further.

e.g. 374 × 63 = 23562

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| x | 3**00** | 7**0** | 4 |  | 18000  4200  240  900  210  12 +  23562  11 | We split 374 into 3**00**, 7**0** and 4. 63 becomes 6**0** and 3. |
| 6**0** | 18**000** | 42**00** | 24**0** |  | 3**00** × 6**0** = 18**000**, 7**0** × 6**0** = 42**00, 4 × 60 = 240.** |
| 3 | 9**00** | 21**0** | 12 |  | Also 3**00** × 3 = 9**00**, 7**0** × 3 = 2**10** and 4 x 3 = 12. |
|  |  |  |  |  | Finally add up all these answers. |

Now try these.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1.** | 34 × 25 = | **2.** | 43 × 24 = | **3.** | 53 × 16 = | **4.** | 72 × 24 = | **5.** | 64 × 35 = |
| **6.** | 27 × 38 = | **7.** | 54 × 36 = | **8.** | 259 × 34 = | **9.** | 283 × 42 = | **10.** | 458 × 37 = |

**7a. Dividing two and three-digit numbers by one-digit numbers**

We can use our multiplication tables to help as they are inverse operations.

e.g. 4 × 7 = 28 … so … 28 ÷ 7 = 4 … and … 28**0** ÷ 7 = 4**0**

e.g. 42 ÷ 6 = 7 … because … 7 × 6 = 42 [6 × table … 6, 12, 18, 24, 30, 36, **42**,…]

Now try these.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1.** | 18 ÷ 3 = | **2.** | 20 ÷ 5 = | **3.** | 24 ÷ 6 = | **4.** | 27 ÷ 9 = | **5.** | 30 ÷ 6 = |
| **6.** | 42 ÷ 7 = | **7.** | 36 ÷ 9 = | **8.** | 48 ÷ 8 = | **9.** | 70 ÷ 10 = | **10.** | 72 ÷ 8 = |

And these…

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **11.** | 18**0** ÷ 3 = | **12.** | 20**0** ÷ 5 = | **13.** | 24**0** ÷ 6 = | **14.** | 12**0** ÷ 4 = | **15.** | 30**0** ÷ 5 = |
| **16.** | 28**0** ÷ 7 = | **17.** | 36**0** ÷ 9 = | **18.** | 24**0** ÷ 8 = | **19.** | 70**0** ÷ 10 = | **20.** | 72**0** ÷ 8 = |

**7b. Use of ‘chunking**

|  |  |  |  |
| --- | --- | --- | --- |
| e.g. 266 ÷ 7 = 38 | |  | Write our 7 ÷ table: 7, 14, 21, 28, 35, 42, 49, 56, 63, 70  Working from left. ‘7 into 2’ doesn’t go. Carry the ‘2’ into next column.  ‘7 into 26’ goes ***3*** times with ‘5’ left over [as 7 × 3 = 21].  Carry the ‘5’ into the next column.  Finally ‘7 into 56’ goes ***8*** times. |
|  |  |  |
|  | 0 **3**  8 |  |
| 7 | 2 26 56 |  |

Now try these.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1.** | 186 ÷ 3 = | **2.** | 145 ÷ 5 = | **3.** | 204 ÷ 6 = | **4.** | 184 ÷ 4 = | **5.** | 234 ÷ 6 = |
| **6.** | 175 ÷ 7 = | **7.** | 234 ÷ 9 = | **8.** | 144 ÷ 8 = | **9.** | 170 ÷ 10 = | **10.** | 576 ÷ 8 = |

Another way is to use ‘chunking’ by repeated subtraction or ‘building up’.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 0 **3**  8 |  |  | Write our 7 ÷ table: 7, 14, 21, 28, 35, 42, 49, *56*, 63, 70.  Try to build up with powers of 10: 70, 140, **210**, 280, …  ‘**210’** is the closest multiple up to 266 … 7 × **30.**  Build this up to ‘266’ by either adding … 266 – 210 = *56*.  7 × **8** = *56*.  Finally we add up our multiples. 30 + 8 = 38. |
| 7 | 2 6 6 |  |
|  | 2 1 0 | = 7 x 8 |
|  | 5 6 |  |
|  | 5 6 | = 7 x 8 |
| Answer = **30** + **8** = 38 | | |

Now try these.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **11.** | 192 ÷ 6 = | **12.** | 345 ÷ 5 = | **13.** | 264 ÷ 6 = | **14.** | 232 ÷ 4 = | **15.** | 534 ÷ 6 = |
| **16.** | 441 ÷ 7 = | **17.** | 567 ÷ 9 = | **18.** | 344 ÷ 8 = | **19.** | 1248 ÷ 4 = | **20.** | 1472 ÷ 8 = |

And these …

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **21.** | 1422 ÷ 3 = | **22.** | 2910 ÷ 5 = | **23.** | 3144 ÷ 6 = | **24.** | 5204 ÷ 4 = | **25.** | 3025 ÷ 5 = |