

Whole Number Division

1-Digit and 2-Digit Division and Problem Solving

In basic computations, we divide to find the quotient. Think about having 200 pieces of candy that you want to share equally with your friends. Including yourself and 3 friends, you would divide the 200 pieces of candy into 4 groups.

First, we'll divide with the divisor being a single digit. Then, we'll look at zeros used as placeholders in the quotient. We'll extend our division skills as we divide by a two-digit divisor and look at zeros that occur in some quotients.

We will apply division to word problems. Look for key words and read the problem more than once.

Whole Number Division by One Digit

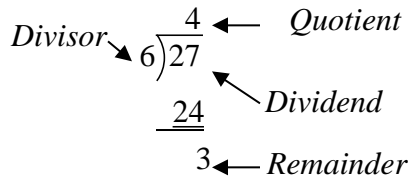
Whole Number Division by One Digit with Zeros

Whole Number Division by Two Digits

Whole Number Division by Two Digits with Zeros

Problem Solving - Division

Whole Number Division by One Digit



Example One

Estimate the quotient, then solve: $25798 \div 7$

Estimation: $28,000 \div 7 = 4,000$
 (Round 25,791 to a close number divisible by 7 evenly.)

The estimated answer is 4,000.

Solution:

<i>5 Steps for Division</i>	Divide 25 by 7	<i>5 Steps for Division</i>	Divide 47 by 7
<p>Divide 25 by 7 to get 3 Multiply 3×7 to get 21 Subtract 21 from 25 to get 4 Compare 4 with 7 (4 must be smaller than divisor) Bring Down 7</p>	$\begin{array}{r} 3 \\ 7 \overline{)25798} \\ \underline{21} \\ 47 \\ \underline{42} \\ 59 \\ \underline{56} \\ 38 \\ \underline{35} \\ 3 \end{array}$	<p>Divide 47 by 7 to get 6 Multiply 6×7 to get 42 Subtract 42 from 47 to get 5 Compare 5 with 7 (5 must be smaller than divisor) Bring Down 9</p>	$\begin{array}{r} 36 \\ 7 \overline{)25798} \\ \underline{21} \\ 47 \\ \underline{42} \\ 59 \\ \underline{56} \\ 38 \\ \underline{35} \\ 3 \end{array}$

<i>5 Steps for Division</i>	Divide 59 by 7	<i>5 Steps for Division</i>	Divide 38 by 7
<p>Divide 59 by 7 to get 8 Multiply 8×7 to get 56 Subtract 56 from 59 to get 3 Compare 3 with 7 (3 must be smaller than divisor) Bring Down 8</p>	$\begin{array}{r} 3 \ 68 \\ 7 \overline{)25798} \\ \underline{21} \\ 47 \\ \underline{42} \\ 59 \\ \underline{56} \\ 38 \\ \underline{35} \\ 3 \end{array}$	<p>Divide 38 by 7 to get 5 Multiply 5×7 to get 35 Subtract 35 from 38 to get 3 Compare 3 with 7 (3 must be smaller than divisor) Bring Down - Nothing to bring down so 3 is the remainder</p>	$\begin{array}{r} 3685 \\ 7 \overline{)25798} \\ \underline{21} \\ 47 \\ \underline{42} \\ 59 \\ \underline{56} \\ 38 \\ \underline{35} \\ 3 \end{array}$

Answer: $25,798 \div 7 = 3685R3$

Check: *The estimated answer, 4000, is close to 3685R3.*

Quotient \times Divisor + Remainder = Dividend

$$3685 \times 7 = 25795 + 3 = 25798$$

Whole Number Division by One Digit with Zeros

Estimate the quotient, then solve: $1227 \div 4$

Estimation: $1200 \div 4 = 300$
 (Round 1227 to a close number divisible by 4 evenly.)
The estimated answer is 300.

Solution:

5 Steps for Division

Divide 12 by 4

5 Steps for Division

Divide 2 by 4

Divide 12 by 4 to get 3
Multiply 3×4 to get 12
Subtract 12 from 12 to get 0
Compare 0 with 4
 (0 must be smaller than divisor)
Bring Down 2

$$\begin{array}{r} 3 \\ 4 \overline{)1227} \\ \underline{12} \\ 02 \end{array}$$

Divide 2 by 4 to get 0
Multiply 0×4 to get 0
Subtract 0 from 2 to get 2
Compare 2 with 4
 (2 must be smaller than divisor)
Bring Down 7

$$\begin{array}{r} 30 \\ 4 \overline{)1227} \\ \underline{12} \\ 02 \\ \underline{0} \\ 27 \end{array}$$

5 Steps for Division

Divide 27 by 4

Divide 27 by 4 to get 6
Multiply 6×4 to get 24
Subtract 24 from 27 to get 3
Compare 3 with 4
 (3 must be smaller than divisor)
Remainder is 3 (nothing to bring down)

$$\begin{array}{r} 306 \\ 4 \overline{)1227} \\ \underline{12} \\ 02 \\ \underline{0} \\ 27 \\ \underline{24} \\ 3 \end{array}$$

Hint: Since 02 is smaller than 4 after bringing down, a zero must be placed in the quotient in the divide step.

Answer: $1227 \div 4 = 306R3$

Check: *The estimated answer, 300, is close to 306R3.*
Quotient \times Divisor + Remainder = Dividend
 $306 \times 4 = 1224 + 3 = 1227$

Whole Number Division by Two Digits

Estimate the quotient, then solve: $3691 \div 39$

Estimation: $3600 \div 40 = 90$
(Round 3691 to a close number divisible by 40 evenly.)
The estimated answer is 90.

Solution:

5 Steps for Division

- ▶ **Divide** 369 by 39 to get 9
- Multiply** 9×39 to get 351
- Subtract** 351 from 369 to get 18
- Compare** 18 with 39
(18 must be smaller than divisor)
- Bring Down** 1

Divide 369 by 39

$$\begin{array}{r} 9 \\ 39 \overline{)3691} \\ \underline{351} \\ 181 \end{array}$$

Hint: Sometimes it is easier to find the number in the quotient by rounding the divisor. Round 39 to 40, then think "How many 40's are in 369?"

5 Steps for Division

- ▶ **Divide** 181 by 39 to get 4
- Multiply** 4×39 to get 156
- Subtract** 156 from 181 to get 25
- Compare** 25 with 39
(25 must be smaller than divisor)
- Remainder** 25 (no more numbers to bring down)

Divide 181 by 39

$$\begin{array}{r} 4 \\ 39 \overline{)181} \\ \underline{156} \\ 25 \end{array}$$

Hint: Round 39 to 40, then think "How many 40's are in 181?"

Answer: $3691 \div 39 = 94 \text{ R}25$

Check: *The estimated answer, 90, is close to 94R25.*
Quotient \times Divisor + Remainder = Dividend
 $39 \times 94 = 3666 + 25 = 3691$

Whole Number Division by Two Digits with Zeros

Estimate the quotient, then solve: $1859 \div 23$

Estimation: $1800 \div 20 = 90$
(Round 1851 to a close number that divides by 20 evenly.)
The estimated answer is 90.

Solution:

5 Steps for Division

- **Divide** 185 by 23 to get 8
- Multiply** 8×23 to get 184
- Subtract** 184 from 185 to get 1
- Compare** 1 with 23
(1 must be smaller than divisor)
- Bring Down** 9

Divide 185 by 23

$$\begin{array}{r} 8 \\ 23 \overline{)1859} \\ \underline{184} \\ 19 \end{array}$$

Hint: Sometimes it is easier to find the number in the quotient by rounding the divisor. Round 23 to 20, then think "How many 20's are in 185?" In this case 9 would be too many, so drop down to 8 and multiply again.

5 Steps for Division

- **Divide** 19 by 23 to get 0
- Multiply** 0×23 to get 0
- Subtract** 0 from 19 to get 19
- Compare** 19 with 23
(19 must be smaller than divisor)
- Remainder** 19 (no more numbers to bring down)

Divide 19 by 23

$$\begin{array}{r} 80 \\ 23 \overline{)1859} \\ \underline{184} \\ 19 \\ \underline{0} \\ 19 \end{array}$$

Hint: Since 19 is smaller than 23 after bringing down, a zero must be placed in the quotient in the divide step.

Answer: $1859 \div 23 = 80 \text{ R}19$

Check: *The estimated answer, 90, is close to 80 R19.*
Quotient \times Divisor + Remainder = Dividend
 $80 \times 23 = 1840 + 19 = 1859$

Problem Solving - Division

There are 26 members in the PALS Club. The club members raised \$500 to attend the local hockey game. The hockey game tickets totaled \$325. They decided to share the money that was left after purchasing the tickets equally amongst all the members. How much did each member receive? (Round this answer to the nearest penny.)

This is a two step problem. First figure the money that is left (subtract).

$$\$500 - \$325 = \$175$$

To figure the equal shares, you would divide the money left by the number of members.

$$\$175 \div 26 = \$6.730 \text{ which rounds to } \$6.73 \text{ for each member.}$$