

Examples for the **divdiagram** Package

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1 Basic Usage

1.1 Simple Division

Division of 97 by 5:

$$\begin{array}{r} 97 \quad | \quad 5 \\ 2 \quad 19 \quad | \quad 5 \\ 4 \quad 3 \end{array}$$

Division of 100 by 7:

$$\begin{array}{r} 100 \quad | \quad 7 \\ 2 \quad 14 \quad | \quad 7 \\ 0 \quad 2 \end{array}$$

1.2 With Circle Highlighting

Same divisions with circles highlighting the remainders:

$$\begin{array}{r} 97 \quad | \quad 5 \\ \textcircled{2} \quad 19 \quad | \quad 5 \\ \textcircled{4} \quad \textcircled{3} \end{array}$$

$$\begin{array}{r} 100 \quad | \quad 7 \\ \textcircled{2} \quad 14 \quad | \quad 7 \\ \textcircled{0} \quad \textcircled{2} \end{array}$$

1.3 With Arrow

Arrow showing reading direction (useful for base conversion):

$$\begin{array}{r} 97 \quad | \quad 5 \\ 2 \quad 19 \quad | \quad 5 \\ \swarrow 4 \quad 3 \end{array}$$

$$\begin{array}{r} 100 \quad | \quad 7 \\ 2 \quad 14 \quad | \quad 7 \\ \swarrow 0 \quad 2 \end{array}$$

1.4 Both Options Combined

97 | 5
 (2) 19 | 5
 (4) (3)

$$\begin{array}{r|l} 100 & 7 \\ \textcircled{2} & 14 \quad 7 \\ & \textcircled{0} \textcircled{2} \end{array}$$

1.5 With Underline Highlighting

Underline highlighting using the uline option:

$$\begin{array}{r|l} 97 & 5 \\ \hline 2 & 19 \end{array} \begin{array}{r|l} & 5 \\ \hline & 4 \end{array} \begin{array}{r|l} & 3 \\ \hline & \end{array}$$

$$\begin{array}{r|l} 100 & 7 \\ \underline{2} & 14 \quad 7 \\ & 0 \quad 2 \end{array}$$

1.6 Underline with Arrow

$$\begin{array}{r} 97 \overline{) 519} \\ \underline{2} \\ 19 \\ \underline{4} \\ 3 \end{array}$$

1.7 All Three Options Combined

Circle, underline, and arrow together:

97 | 5
 (2) 19 | 5
 (4) (3)

2 Base Conversion

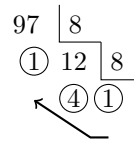
2.1 Binary Conversion

Converting 255 to binary (read remainders from bottom to top):

Result: $255_{10} = 11111111_2$

2.2 Octal Conversion

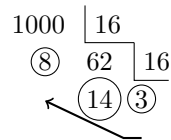
Converting 97 to octal:



Result: $97_{10} = 141_8$

2.3 Hexadecimal Conversion

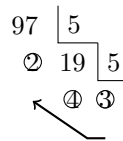
Converting 1000 to hexadecimal:



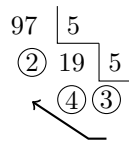
Result: $1000_{10} = 3E8_{16}$ (where 14 = E)

3 Custom Circle Sizes

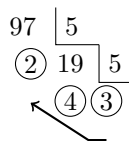
3.1 Smaller Circles (inner sep = 0.05)



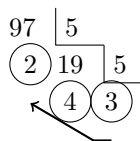
3.2 Default Circles (inner sep = 0.25)



3.3 Medium Circles (inner sep = 0.3)



3.4 Larger Circles (inner sep = 0.5)



4 Edge Cases

4.1 Dividend Less Than Divisor

When the dividend is smaller than the divisor:

$$\begin{array}{r} 3 \overline{) 10} \\ \underline{30} \end{array}$$

4.2 Dividend Equal to Divisor

$$\begin{array}{r} 7 \overline{) 7} \\ \underline{07} \end{array}$$

4.3 Dividend is Zero

$$\begin{array}{r} 0 \overline{) 5} \\ \underline{00} \end{array}$$

4.4 Single Division Step

$$\begin{array}{r} 10 \overline{) 3} \\ \underline{13} \end{array}$$

5 Large Numbers

5.1 Million

$$\begin{array}{r} 1000000 \overline{) 7} \\ \underline{142857} \end{array}$$

5.2 Large Dividend, Small Divisor

$$\begin{array}{r} 9876543 \overline{) 11} \\ \underline{897867} \end{array}$$

5.3 Ten Factorial

$$10! = 3628800$$

$$\begin{array}{r}
 3628800 \quad | \quad 11 \\
 10 \quad 329890 \quad | \quad 11 \\
 \quad 0 \quad 29990 \quad | \quad 11 \\
 \quad \quad 4 \quad 2726 \quad | \quad 11 \\
 \quad \quad \quad 9 \quad 247 \quad | \quad 11 \\
 \quad \quad \quad \quad 5 \quad 22 \quad | \quad 11 \\
 \quad \quad \quad \quad \quad 0 \quad 2
 \end{array}$$

6 In-line Usage

$$\begin{array}{r}
 42 \quad | \quad 5 \\
 2 \quad 8 \quad | \quad 5
 \end{array}$$

Division can be used in-line as well: $\frac{3}{1}$ produces a diagram within the text, though displayed equations ($\displaystyle \frac{\dots}{\dots}$) are recommended for better readability.