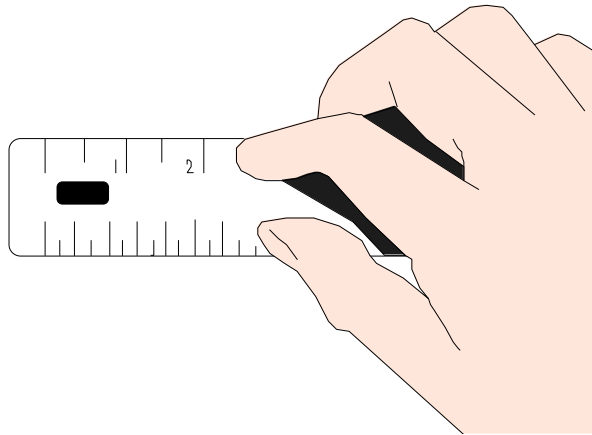
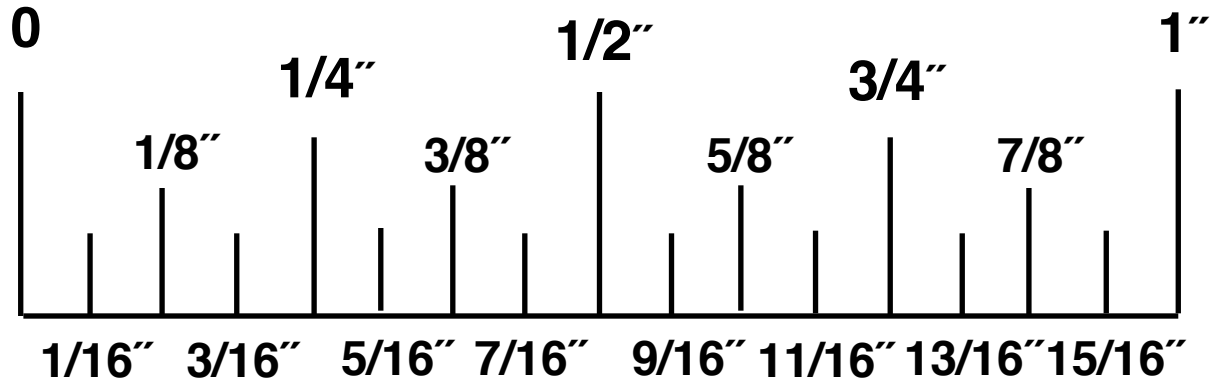


# Introduction to Printing Math





**Each line = to  $1/16''$**

**Every 2 lines = to  $1/8''$**

**Every 4 lines = to  $1/4''$**

**Every 8 lines = to  $1/2''$**

**Every 16 lines = to  $1''$**

**Find the fractions which are one larger and one smaller  
when using a 1/16" scale.**

**Example:**

$$\frac{9}{16} \quad 5/8'' \quad \frac{11}{16}$$

**Solve the following problems - instructor will check your work when complete!**

$$\text{—— } 3/8'' \text{ ——}$$

$$\frac{\text{——}}{16} \quad 7/8'' \quad \frac{\text{——}}{16}$$

$$\text{—— } 1/8'' \text{ ——}$$

$$\text{—— } 3/8'' \text{ ——}$$

$$\text{—— } 1/2'' \text{ ——}$$

$$\text{—— } 1/4'' \text{ ——}$$

$$\text{—— } 3/16'' \text{ ——}$$

$$\text{—— } 7/16'' \text{ ——}$$

$$\text{—— } 11/16'' \text{ ——}$$

# **Finding Half of a Fraction or Fraction and Whole Number**

<b>Sample 1</b>	<b>Finding half of a fraction:</b>	<b><math>\frac{7}{8}</math>"</b>
	<b>a) Top of fraction remains the same.</b>	<b><math>\frac{7}{/}</math></b>
	<b>b) Double bottom of fraction. (2x8)</b>	<b><math>\frac{7}{16}</math>"</b>
<b>Sample 2</b>	<b>When whole number is even:</b>	<b><math>8 \frac{7}{8}</math>"</b>
	<b>a) Find half of the whole number.</b>	<b>4</b>
	<b>b) Top of fraction remains the same.</b>	<b><math>4 \frac{7}{/}</math></b>
	<b>c) Double bottom of fraction. (2x8)</b>	<b><math>4 \frac{7}{16}</math>"</b>
<b>Sample 3</b>	<b>When whole number is odd:</b>	<b><math>5 \frac{7}{8}</math>"</b>
	<b>a) Find half of the whole number and forget the remainder. (<math>\frac{1}{2}</math>)</b>	<b>2</b>
	<b>b) Add top and bottom of fraction and write total on top.</b>	<b><math>2 \frac{15}{/}</math></b>
	<b>c) Double bottom of fraction. (2x8)</b>	<b><math>2 \frac{15}{16}</math>"</b>

**Solve the following problems - instructor will check your work when complete!**

$$1/4'' = \underline{\hspace{1cm}}$$

$$4 \ 5/8'' = \underline{\hspace{1cm}}$$

$$3 \ 1/4'' = \underline{\hspace{1cm}}$$

$$7/16'' = \underline{\hspace{1cm}}$$

$$6 \ 1/4'' = \underline{\hspace{1cm}}$$

$$5 \ 3/8'' = \underline{\hspace{1cm}}$$

$$5/8'' = \underline{\hspace{1cm}}$$

$$2 \ 7/8'' = \underline{\hspace{1cm}}$$

$$7 \ 5/16'' = \underline{\hspace{1cm}}$$

$$11/16'' = \underline{\hspace{1cm}}$$

$$8 \ 9/16'' = \underline{\hspace{1cm}}$$

$$1 \ 1/2'' = \underline{\hspace{1cm}}$$

## Printers Point System

**6 picas = one inch**  
**12 points = one pica**  
**72 points = one inch**

**Points are used to size type!**

This is 9 pt. or 1/8 of an inch.

**This is 18 pt. or 1/4 of an inch.**

**This is 36 pt. or 1/2 of an inch.**

**This is 54 pt.**

**This is 72 pt.**

**Solve the following problems - instructor will check your work when complete!**  
**Use another sheet of paper if necessary!**

**Add the following:**

$$\begin{array}{r} 234 \\ 456 \\ 233 \\ +123 \\ \hline \end{array}$$

$$\begin{array}{r} 333 \\ 780 \\ 145 \\ +654 \\ \hline \end{array}$$

$$\begin{array}{r} 489 \\ 75 \\ 845 \\ +350 \\ \hline \end{array}$$

**Divide the following:**

$$35 \overline{) 49,045}$$

$$12 \overline{) 3699}$$

$$125 \overline{) 950,725}$$

$$235 \overline{) 65,890}$$

**Subtract the following:**

$$\begin{array}{r} 877 \\ - 375 \\ \hline \end{array}$$

$$\begin{array}{r} 535 \\ - 178 \\ \hline \end{array}$$

$$\begin{array}{r} 4,890 \\ - 3,756 \\ \hline \end{array}$$

$$\begin{array}{r} 7,983 \\ - 7,345 \\ \hline \end{array}$$

$$\begin{array}{r} 15,760 \\ - 3,675 \\ \hline \end{array}$$

**Multiply the following:**

$$\begin{array}{r} 125 \\ \times 40 \\ \hline \end{array}$$

$$\begin{array}{r} 500 \\ \times 150 \\ \hline \end{array}$$

$$\begin{array}{r} 250 \\ \times 70 \\ \hline \end{array}$$

$$\begin{array}{r} 2,550 \\ \times 200 \\ \hline \end{array}$$

$$\begin{array}{r} 8,750 \\ \times 100 \\ \hline \end{array}$$

# Working with Fractions

**Addition: (always reduce to simplest form)**

**Example:**

a.  $\frac{3}{7} + \frac{2}{7} = \frac{3 + 2}{7} = \frac{5}{7}$

b.  $\frac{2}{6} + \frac{2}{6} = \frac{2 + 2}{6} = \frac{4}{6} = \frac{2}{3}$

c.  $\frac{3}{4} + \frac{2}{4} = \frac{3 + 2}{4} = \frac{5}{4} = 1 \frac{1}{4}$

d.

$$\begin{array}{r} 6 \frac{2}{4} \\ + 3 \frac{1}{4} \\ \hline 9 \frac{3}{4} \end{array}$$

**Subtracting: (find common denominator when necessary)**

**Example:**

a.

$$\begin{array}{r} 6 \frac{4}{9} \\ - 2 \frac{1}{9} \\ \hline 4 \frac{3}{9} = 4 \frac{1}{3} \end{array}$$

b.

$$\begin{array}{r} 9 \frac{1}{3} = 9 \frac{4}{12} \\ - 4 \frac{1}{12} = 4 \frac{1}{12} \\ \hline 5 \frac{3}{12} = 5 \frac{1}{4} \end{array}$$



# Working with Fractions

**Multiplying: (reduce to simplest form)**

**Example:**

- a.  $2/3 \times 5/7 = (2 \times 5 = 10 \text{ \& } 3 \times 7 = 21) = 10/21$
- b.  $1/5 \times 2/3 \times 1/7 = (1 \times 2 \times 1 = 2 \text{ \& } 5 \times 3 \times 7 = 105) = 2/105$
- c.  $2/3 \times 5 = 2/3 \times 5/1 = (2 \times 5 = 10 \text{ \& } 3 \times 1 = 3) = 10/3 = 3 \frac{1}{3}$
- d.  $2/9 \times 3/7 = 2/3 \times 1/7 = (2 \times 1 = 2 \text{ \& } 3 \times 7 = 21) = 2/21$

**Dividing: (Change improper fraction to a whole number)**

**Example:**

- a.  $1 \frac{3}{4} \div 8 = \frac{1 \times 8}{4 \times 3} = \frac{8}{12} = \frac{4}{6} = \frac{2}{3}$
- b.  $2 \frac{1}{4} \div \frac{1}{3} = \frac{9}{4} \div \frac{1}{3} = \frac{9}{4} \times \frac{3}{1} = \frac{27}{4} = 6 \frac{3}{4}$

**Complete the following Fraction Problems: Use extra paper if necessary,  
Keep answers in simplest form. Turn in all paper work!**

**Adding: a.  $\frac{2}{7} + \frac{1}{7} =$       b.  $\frac{9}{15} + \frac{7}{15} =$       c.  $\frac{1}{16} + \frac{3}{16} + \frac{5}{16} =$**

**d.  $\frac{4}{16} + \frac{2}{16} =$       e.  $\frac{4}{11} + \frac{7}{11} + \frac{2}{11} + \frac{3}{11} =$**

**Subtracting:      a.  $\frac{8}{9}$       b.  $\frac{3}{4}$       c.  $20 \frac{1}{4}$   
       $-\underline{\frac{2}{9}}$        $-\underline{\frac{1}{2}}$        $-\underline{9 \frac{3}{4}}$**

**d.  $16 \frac{7}{8}$       e.  $13 \frac{3}{5}$   
       $-\underline{9 \frac{1}{2}}$        $-\underline{8 \frac{1}{3}}$**

**Complete the following Fraction Problems: Use extra paper if necessary  
Keep answers in simplest form. Turn in all paper work!**

**Multiplication:**

**a.  $\frac{3}{4} \times 6 =$**

**b.  $\frac{1}{7} \times \frac{2}{3} =$**

**c.  $\frac{5}{12} \times \frac{4}{5}$**

**d.  $\frac{5}{9} \times \frac{2}{3} \times \frac{1}{7} =$**

**e.  $\frac{8}{9} \times \frac{1}{3} =$**

**Divide:**

**a.  $\frac{7}{9} \div \frac{2}{3} =$**

**b.  $3\frac{1}{2} \div \frac{1}{7} =$**

**c.  $\frac{4}{9} \div \frac{2}{3} =$**

# Working with Decimals

## Adding Examples:

$$\begin{array}{r} \text{a.} \quad 9.050 \\ 123.300 \\ +22.345 \\ \hline 154.695 \end{array}$$

$$\begin{array}{r} \text{b.} \quad 654.003 \\ 12.750 \\ +00.500 \\ \hline 667.253 \end{array}$$

$$\begin{array}{r} \text{c.} \quad 8.020 \\ .800 \\ +875.563 \\ \hline 884.383 \end{array}$$

## Subtracting Examples:

$$\begin{array}{r} \text{a.} \quad 29.600 \\ -14.827 \\ \hline 14.773 \end{array}$$

$$\begin{array}{r} \text{b.} \quad 56.500 \\ -23.085 \\ \hline 33.415 \end{array}$$

$$\begin{array}{r} \text{c.} \quad 375.899 \\ -156.800 \\ \hline 219.099 \end{array}$$

# Working with Decimals

## Multiplying Examples:

a. 
$$\begin{array}{r} 4.23 \\ \times 6 \\ \hline 2.538 \end{array}$$

b. 
$$\begin{array}{r} 539 \\ \times .07 \\ \hline 37.73 \end{array}$$

c. 
$$\begin{array}{r} .08 \\ \times .3 \\ \hline .024 \end{array}$$

## Dividing Examples:

a. 
$$\begin{array}{r} 4.15 \\ 3 \overline{) 12.45} \\ \underline{12} \phantom{00} \\ 04 \phantom{00} \\ \underline{-3} \phantom{00} \\ 15 \phantom{00} \\ \underline{15} \phantom{00} \\ 0 \end{array}$$

b. 
$$\begin{array}{r} .053 \\ 5 \overline{) .265} \\ \underline{25} \phantom{00} \\ 15 \phantom{00} \\ \underline{15} \phantom{00} \\ 0 \end{array}$$

c. 
$$\begin{array}{r} 67. \\ .08 \overline{) 5.36.} \\ \rightarrow \underline{48} \rightarrow \\ 56 \\ \underline{56} \\ 0 \end{array}$$

**Complete the following Problems: Use extra paper if necessary,  
Keep answers in simplest form. Turn in all paper work!**

**Adding Decimals:**

a. 
$$\begin{array}{r} .36 \\ 120.005 \\ +135.8 \\ \hline \end{array}$$

b. 
$$\begin{array}{r} 12.005 \\ .67 \\ +89.09 \\ \hline \end{array}$$

c. 
$$\begin{array}{r} 45.06 \\ 2.587 \\ +.879 \\ \hline \end{array}$$

d. 
$$\begin{array}{r} 178.004 \\ 45.119 \\ +7.333 \\ \hline \end{array}$$

**Subtracting Decimals:**

a. 
$$\begin{array}{r} 623.89 \\ -598.087 \\ \hline \end{array}$$

b. 
$$\begin{array}{r} 45.67 \\ -8.34 \\ \hline \end{array}$$

c. 
$$\begin{array}{r} 12.089 \\ -8.643 \\ \hline \end{array}$$

d. 
$$\begin{array}{r} .99 \\ -.45 \\ \hline \end{array}$$

**Complete the following Problems: Use extra paper if necessary, Keep answers in simplest form. Turn in all paper work!**

**Multiplying Decimals:**

a. 
$$\begin{array}{r} 3.2 \\ \times .06 \\ \hline \end{array}$$

b. 
$$\begin{array}{r} 56 \\ \times .25 \\ \hline \end{array}$$

c. 
$$\begin{array}{r} 3.75 \\ \times .50 \\ \hline \end{array}$$

d. 
$$\begin{array}{r} 45.67 \\ \times .075 \\ \hline \end{array}$$

**Dividing Decimals:**

a. 
$$12 \overline{) .720}$$

b. 
$$24 \overline{) 9.84}$$

c. 
$$.072 \overline{) 19.904}$$

d. 
$$35 \overline{) 7.98}$$

## Changing Decimals to Fractions:

**Example A: Change .24 to a common fraction.**

**Step 1** Write 24 as the top number.  $\underline{24}$

**Step 2** Two places means hundredths. Write  $\frac{24}{100}$   
100 as the bottom number.  $100$

**Step 3** Reduce the fraction. Both numbers can  $\frac{24 \div 4 = 6}{100 \div 4 = 25}$   
be divided evenly by 4.

**Example B: Change 9.015 to a mixed number.**

**Step 1** Write 9 as the whole number and 15  $9 \frac{15}{1000}$   
as the top number of the fraction.

**Step 2** Three places means thousandths.  $9 \frac{15}{1000}$   
Write 1,000 as the bottom number.

**Step 3** Reduce the fraction. Both numbers  
can be divided by 5.  $9 \frac{15 \div 5 = 3}{1000 \div 5 = 200}$



## Changing a Fractions to Decimals:

**Example: Change  $5/8$  to a decimal.**

**Step 1 Divide the bottom number (8) into the top number (5)**

$$8 \overline{) 5}$$

**Step 2 Add a decimal point and zeros. Divide**

$$8 \overline{) 5.000} \begin{array}{r} .625 \end{array}$$

**Complete the following Problems: Use extra paper if necessary, Keep answers in simplest form. Turn in all paper work!**

**Decimals to Fractions:**

a.  $.08$  \_\_\_\_\_

b.  $.085$  \_\_\_\_\_

c.  $9.86$  \_\_\_\_\_

d.  $3.6$  \_\_\_\_\_

e.  $7.22$  \_\_\_\_\_

d.  $123.462$  \_\_\_\_\_

**Fractions to Decimals:**

a.  $1/4 =$  \_\_\_\_\_

b.  $3/4 =$  \_\_\_\_\_

c.  $3/8$  \_\_\_\_\_

d.  $2/9 =$  \_\_\_\_\_

e.  $1/3 =$  \_\_\_\_\_

d.  $11/16$  \_\_\_\_\_

# Changing Decimals to Percents:

To change a decimal to a percent, move the decimal point two (2) places to the RIGHT and write the percent sign (%). If the point moves to the end of the number it is not necessary to write the point.

Examples:  $.35 = 35\%$      $.8 = 80\%$      $.04 = 4\%$      $.0008 = .08\%$

Complete the following:

$.09 = \underline{\hspace{2cm}}$

$.125 = \underline{\hspace{2cm}}$

$.0375 = \underline{\hspace{2cm}}$

$.0016 = \underline{\hspace{2cm}}$

$.9 = \underline{\hspace{2cm}}$

$.005 = \underline{\hspace{2cm}}$

# Changing Percents to Decimals:

To change a percent to a decimal, drop the percent sign and move the point two places to the LEFT.

Examples:  $6\% = .06$      $30\% = .3$      $150\% = 1.5$      $.9\% = .009$

Complete the following:

$20\% =$  \_\_\_\_\_

$8\% =$  \_\_\_\_\_

$3.5\% =$  \_\_\_\_\_

$275\% =$  \_\_\_\_\_

$.075\% =$  \_\_\_\_\_

$.03\% =$  \_\_\_\_\_