Utility Industry Math Boot Camp

How to "Read" a Ruler

Center For ENERGY Workforce Development

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How to “Read” a Ruler
3rd Edition

How to "Read" a Ruler

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INTRODUCTION

This manual is dedicated to someone I've never met. I was told about him when the not-for-profit I founded (Helicon, Inc., the Mathematics Resource and Support Center for Females) first began to collaborate with Brooklyn Woods. A young man had graduated from that very excellent woodworker training program several weeks earlier, and had found a job immediately; but he'd been fired after only ten days on the job. "He couldn't read or use a ruler," one of the instructors told me, "and the employer couldn't afford to keep him on because of all the mistakes he was making. It's too bad because he really was born to be a woodworker." (I've come to know that the young man was not unique in his predicament: Since 2004, 1,794 applicants (168 females, 1,626 males) to Brooklyn Woods scored an average of 33% on a Ruler Quiz used as a screening assessment.) Figuring out a way to help people "read" and use professional measuring tapes was my first assignment at Brooklyn Woods.

So, I wrote this manual and, if I do say so myself, it's pretty effective. Since 2006, the average score of **336** Brooklyn Woods program participants went from 44% on the first Ruler Quiz (administered before they're given a copy of the manual) to 76% on the second Ruler Quiz (administered *just* after they've read the manual and completed the exercises). I gradually incorporated the manual to the various curricula I developed for similar not-for-profit organizations in New York City and the results from those training programs are equally good: The average scores of **1,609** individuals (987 females, 622 males) went from 37% on the first Ruler Quiz to 77% on the second Ruler Quiz.

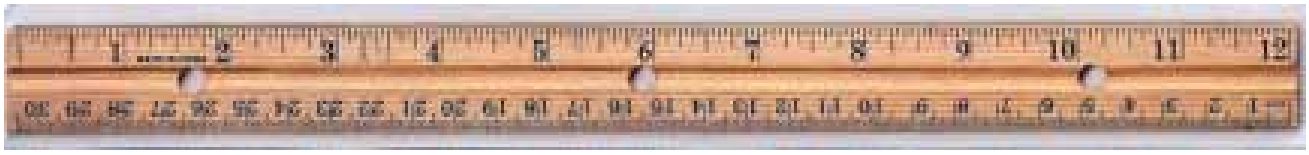
I want to emphasize that I really don't teach my students the material in the manual; they teach themselves. They read, study the illustrations, learn the algorithms, complete all the exercises, and check their answers—immediately correcting any mistakes they might have made. If you want to replicate their results (the *final* Ruler Quiz average score for all **1,609** people was 92%), you'll follow their example.

How to "Read" a Ruler

Part I "Reading" a ruler when what you're measuring falls *exactly* on a line.

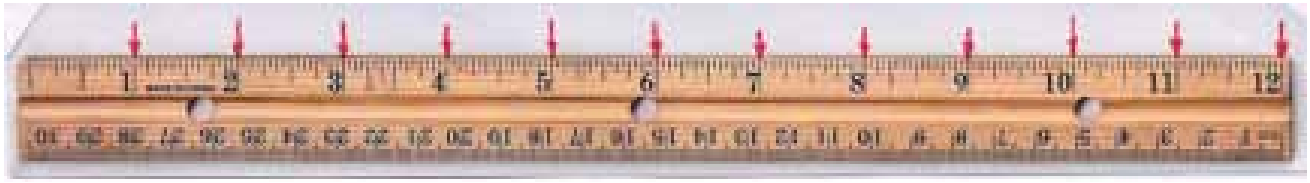
Today you are going to learn, **once and for all**, how to "read" a ruler. (Remember, rulers, like books, are "read" from left to right.)

First, let's take a close look at a typical ruler, the kind you'd find in any classroom or office. A typical ruler is 12 inches, or one foot, long.



(The picture above is 55% the size of the actual ruler.)

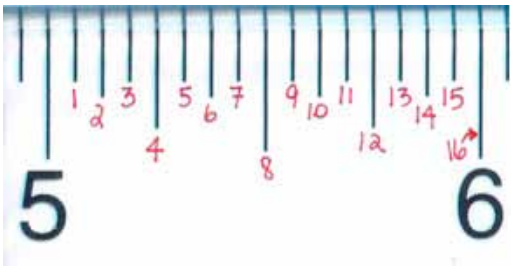
We can see that this foot-ruler is divided into twelve inches; each inch is divided into smaller subdivision. The twelve inches are easy to identify; they are the longest lines with the numbers beside them.



Actually, the inches are always easy to "read" on any ruler no matter how many subdivisions—but then, we've all always known that it's not the inches that make it hard to read a ruler. It's the *smaller* subdivisions that are confusing. (That, and the fact those smaller subdivisions have something to do with fractions—which just about everybody hates!)

On *most* rulers, between any two inches (longest lines) there are sixteen smaller lines. (Very soon, you will understand this means that the inches are divided into sixteenths.) Let's magnify a section of a ruler above so that we can verify that.

How to "Read" a Ruler



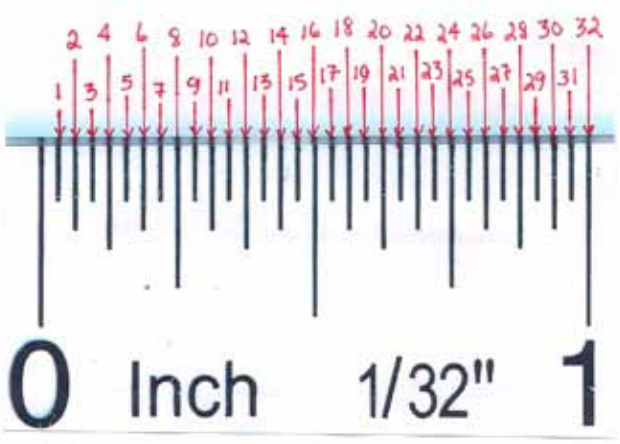
Put your left forefinger on the long line near the "5." Now, with your right forefinger, count, from left to right, all the lines between "5" and "6." Don't include "5" ("5" belongs to what comes before it, just the way a baby becomes one year old after living through her first twelve months), but include "6." How many lines are there? Sixteen—right? There are 16 sixteenths $\left(\frac{16}{16}\right)$ in every inch. That's easy—right?

However, not all rulers are divided into sixteenths. For example, the tape measure that I use when I sew is divided into eighths:

In this case, there are 8 eighths $\left(\frac{8}{8}\right)$ in every inch.

How to "Read" a Ruler

And the six-inch ruler that I carry round in my pencil case is divided into thirty-seconds in the first inch:



In this case, there are 32 thirty-seconds $\left(\frac{32}{32}\right)$ in an inch.

Finally, one of the tools that cabinet makers use is called a combination square, which is actually four separate rulers in one tool; one of these rulers is divided into sixty-fourths! (Count for yourself the number of lines between "3" and "4," not including "3" but including "4.")

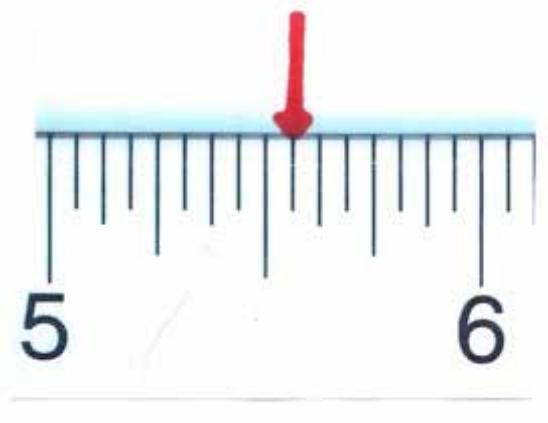
In this case, there are 64 sixty-fourths $\left(\frac{64}{64}\right)$ in an inch.

How to "Read" a Ruler

The point of all of this is: you *must* count the number of lines [subdivisions]! If what you're measuring falls exactly on a line, the number of lines [subdivisions] between those two inches will be the **denominator** (bottom number) of the fractional part of your measurement.

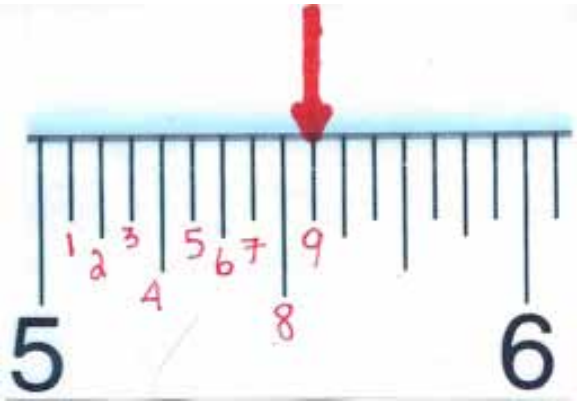
Now, let's find out what that last sentence *really* means.

Let's go back to our original typical ruler. How would you "read" the following length?



Step by step:

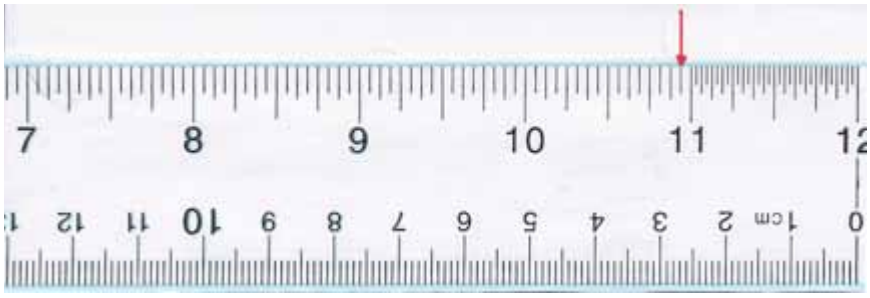
1. Count the total number of subdivisions between the "5" and the "6." There are sixteen—right? Write that number "16" as the **denominator** (bottom number) of the fraction part of the measurement $\frac{}{16}$.
2. Count the number of whole inches. In this measurement, we have 5 complete inches and part of 6 inches. Write "5" for this whole number part of the measurement $5\frac{}{16}$.
3. Count the number of subdivisions from "5" to the red arrow.



Write that number "9" as the **numerator** (top number) of the fraction part of the measurement $5\frac{9}{16}$. The measure of the length on the ruler is $5\frac{9}{16}$ inches.

How to "Read" a Ruler

Let's do another. How would you "read" the following length?



First, let's magnify that section of the ruler.

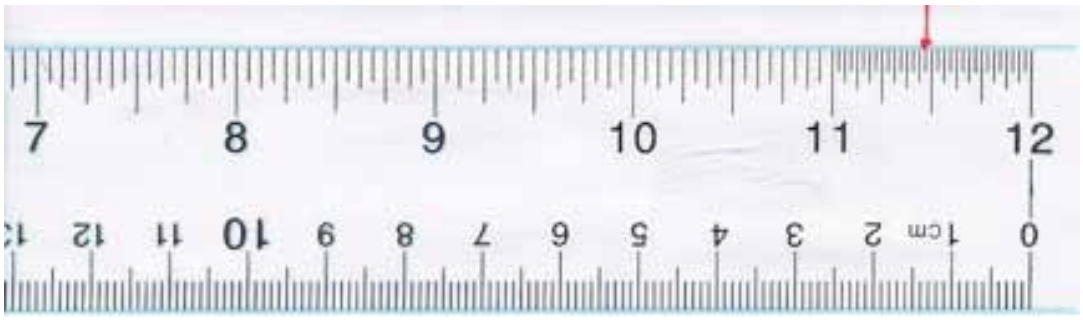
Then, step by step:

1. Count the total number of subdivisions between the "10" and the "11." There are sixteen—right? Write that number "16" as the **denominator** (bottom number) of the fraction part of the measurement $\frac{\ }{16}$.
2. Count the number of whole inches. In this measurement, we have 10 complete inches and part of 11 inches. Write "10" for this whole number part of the measurement $10\frac{\ }{16}$.
3. Count the number of subdivisions from "10" to the red arrow.

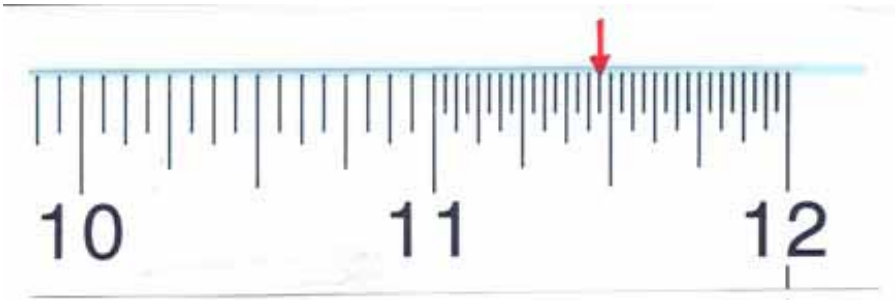
Write that number "15" as the **numerator** (top number) of the fraction part of the measurement: $10\frac{15}{16}$. The measure of the length on the ruler is $10\frac{15}{16}$ inches.

How to "Read" a Ruler

How would you "read" the following length?

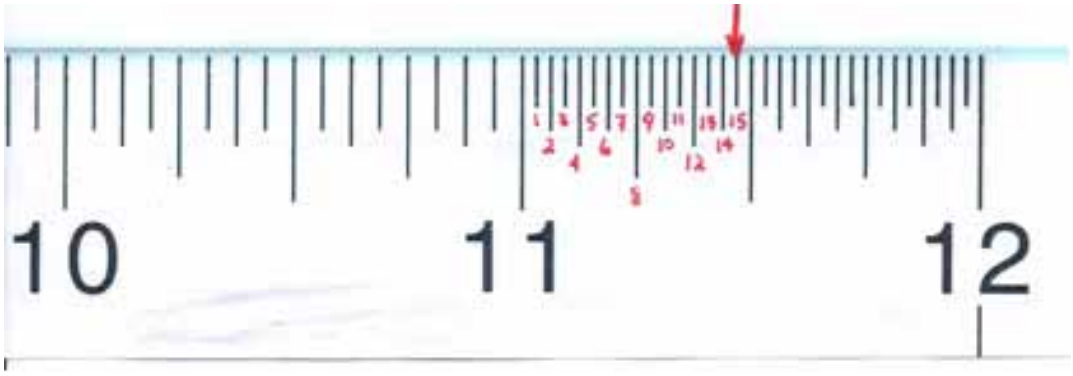


First, let's magnify that section of the ruler, again.



Step by step:

1. Count the total number of subdivisions between the "11" and the "12." There are thirty-two—right? Write that number "32" as the **denominator** (bottom number) of the fraction part of the measurement $\frac{\quad}{32}$.
2. Count the number of whole inches. In this measurement, we have 11 complete inches and part of 12 inches. Write "11" for this whole number part of the measurement $11\frac{\quad}{32}$.
3. Count the number of subdivisions from the "11" to the red arrow.



Write that number "15" as the **numerator** (top number) of the fraction part of the measurement $11\frac{15}{32}$. The measure of the length on the ruler is $11\frac{15}{32}$ inches.

How to "Read" a Ruler

One more time, before you do some drills on your own: how would you "read" the following length?

Step by step:

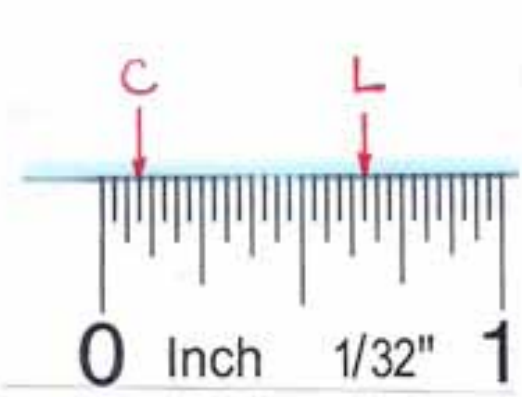
1. Count the total number of subdivisions between the "3" and the "4." There are sixty-four—right? Write that number "64" as the **denominator** (bottom number) of the fraction part of the measurement $\frac{\ }{64}$.
2. Count the number of whole inches. In this measurement, we have 3 complete inches and part of 4 inches. Write "3" for this whole number part of the measurement $3\frac{\ }{64}$.
3. Count the number of subdivisions from the "3" to the red arrow.

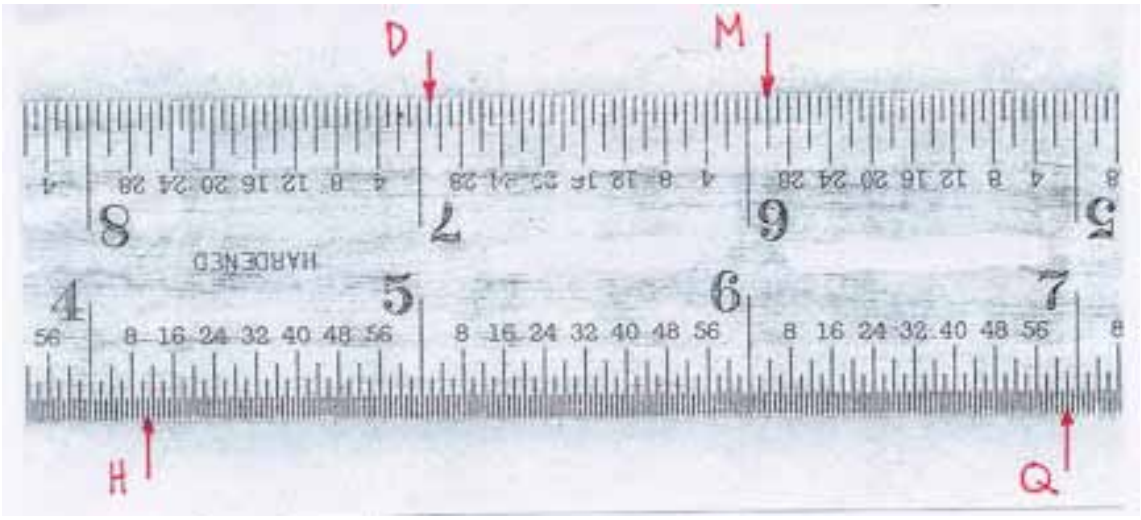
Write that number "49" as the numerator (top number) of the fraction part of the measurement $\frac{49}{64}$. The measure of the length on the ruler is $3\frac{49}{64}$ inches.

How to "Read" a Ruler

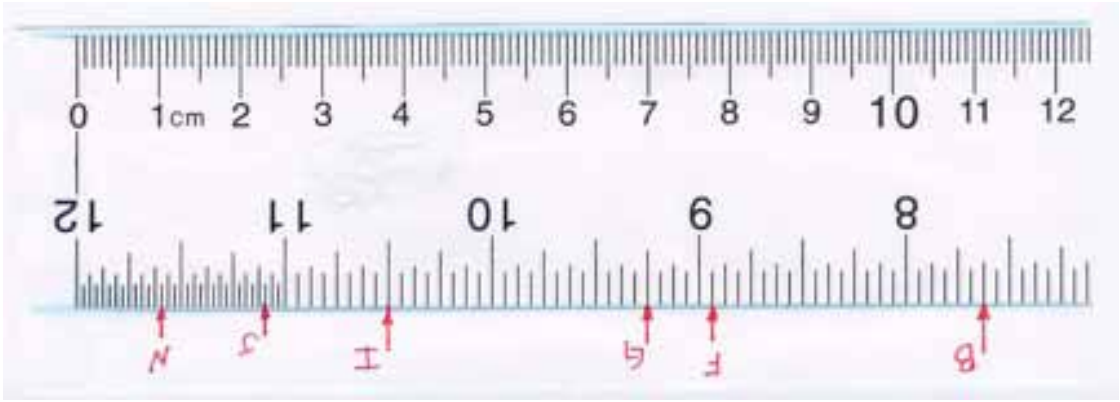
Part I Practice Exercises

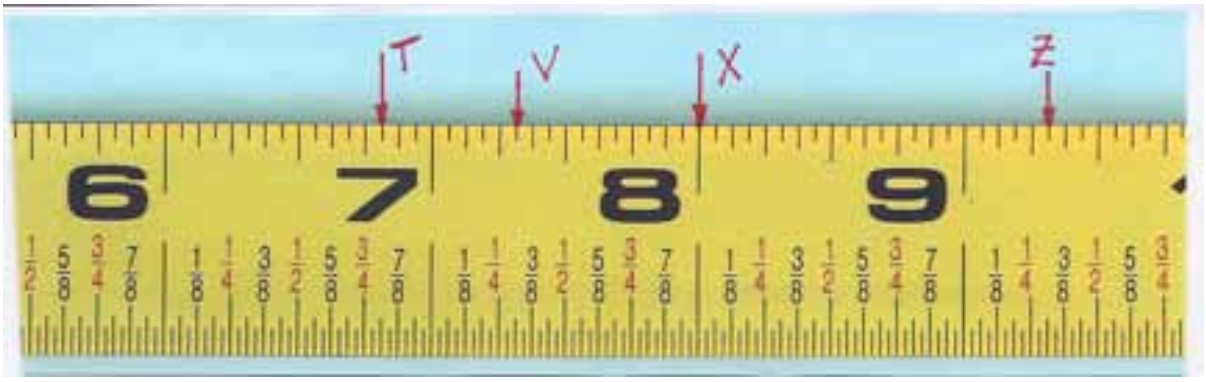
Identify the measurements given on the following inch rulers; record your answers in the answer sheet on page 14. Use the table at the end of the manual to reduce all fractions with even-number numerators to their lowest terms. (answers, page 15)





How to "Read" a Ruler





How to "Read" a Ruler

Part I Practice Exercises, Answer Sheet

A.	**N.**
B.	**O.**
C.	**P.**
D.	**Q.**
E.	**R.**
F.	**S.**
G.	**T.**
H.	**U.**
I.	**V.**
J.	**W.**
K.	**X.**
L.	**Y.**
M.	**Z.**

How to "Read" a Ruler

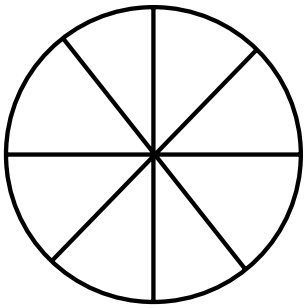
Part I Practice Exercises, Answer Key

A.	$3\frac{2''}{8} = 3\frac{1''}{4}$	**N.**	$11\frac{19''}{32}$
B.	$7\frac{10''}{16} = 7\frac{5''}{8}$	**O.**	$1\frac{11''}{16}$
C.	$\frac{3''}{32}$	**P.**	$8\frac{4''}{8} = 8\frac{1''}{2}$
D.	$6\frac{31''}{32}$	**Q.**	$6\frac{62''}{64} = 6\frac{31''}{32}$
E.	$4\frac{7''}{8}$	**R.**	$2\frac{12''}{16} = 2\frac{3''}{4}$
F.	$8\frac{15''}{16}$	**S.**	$3\frac{7''}{16}$
G.	$9\frac{4''}{16} = 9\frac{1''}{4}$	**T.**	$6\frac{13''}{16}$
H.	$4\frac{11''}{64}$	**U.**	$\frac{25''}{32}$
I.	$10\frac{8''}{16} = 10\frac{1''}{2}$	**V.**	$7\frac{5''}{16}$
J.	$11\frac{3''}{32}$	**W.**	$1\frac{11''}{32}$
K.	$5\frac{1''}{8}$	**X.**	8"
L.	$\frac{21''}{32}$	**Y.**	$3\frac{29''}{32}$
M.	$5\frac{30''}{32} = 5\frac{15''}{16}$	**Z.**	$9\frac{5''}{16}$

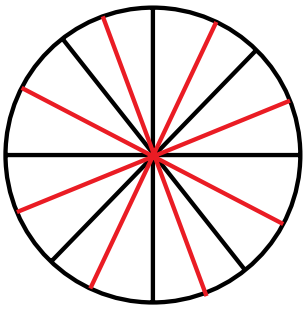
How to "Read" a Ruler

Part II "Reading" a ruler when what you're measuring falls in between two lines.

Now that you can "read" a ruler when the edge of what you're measuring falls *exactly* on a line, it's time for you to learn how to "read" a ruler when the edge of what you're measuring falls *half-way* between two lines. Let's start with something familiar and easy to understand. Suppose you're going to have some friends over for a buffet-style housewarming party. You stock up on beer, order the pizza—and then take a look around your newly decorated apartment: at your newly-stained wood floors, newly-cleaned Persian carpet, newly-upholstered couch and chairs. You envision your dear (but undeniably heedless) friends drinking beer after beer (getting more and more heedless with each beer), waving slices of pizza (dripping tomato sauce and oil and anchovies and melted cheese) as they talk animatedly amongst themselves, and you start to have second thoughts…about the party…about your friends… Then you get a positively *brilliant* idea! You figure if you cut the pizza into smaller slices, people will eat the slices in less time and there will be less junk to drip from each slice, meaning it's less likely your apartment gets trashed. So, when the pizzas arrive, neatly cut into eighths…



…you take out your knife and cut the eights in half.



Notice what happened: When you created smaller (***half*** as big) portions, you created ***twice*** as many portions. (Good to remember: When you ***halve*** something, you ***double*** the number of pieces.) Now, there are sixteen slices; each pizza is divided into *sixteenths*. One can conclude that $\frac{1}{2}$ of $\frac{1}{8} = \frac{1}{16}$. (We know that the word "of" means "multiply" in mathematics. So, if you substitute the times sign (x) for the word "of" in the problem ($\frac{1}{2} \times \frac{1}{8} = \frac{1}{16}$) and do the math, you'll see that the conclusion is valid.)

How to "Read" a Ruler

Let's apply this logic to "reading" a ruler. Supposing you're measuring a piece of fabric and the edge of what you're measuring rests *between* two lines on the tape:

How would you "read" this measurement?

Step by step:

1. Count the total number of subdivisions between the "3" and the "4." There are eight—right? If what you're measuring falls exactly on a line, the number of lines [subdivisions] between those two inches will be the denominator of the fraction part of the measurement. However, if what you're measuring falls between two lines, the denominator of the fraction part of the measurement will be twice the number of lines. So, if the number of lines between the "3" and the "4" is eight, the denominator of this measurement will be two times eight, or sixteen. Write that number "16" as the denominator of the fraction part of the measurement $\frac{\quad}{16}$.
2. Count the number of whole inches. In this measurement, we have 3 complete inches and part of 4 inches. Write "3" for this whole number part of the measurement $3\frac{\quad}{16}$.

3. Identify the eighths immediately before and after the unknown fraction:

$3\frac{6}{8}$ $3\frac{?}{16}$ $3\frac{7}{8}$.

4. Express all fractions in sixteenths: $\frac{6}{8} \times \frac{2}{2} = \frac{12}{16}$ $\frac{7}{8} \times \frac{2}{2} = \frac{14}{16}$

5. Fill in the missing number: $3\frac{12}{16}$ $3\frac{?}{16}$ $3\frac{14}{16}$ $3\frac{12}{16}$ $3\frac{13}{16}$ $3\frac{14}{16}$.

The measure of the length on the tape is $3\frac{13}{16}$ inches.

SHORTCUT: ***To find the denominator, double the number of lines (8 x 2 = 16); to find the numerator, add the lines that come before and after (6 + 7 = 13).***

How to "Read" a Ruler

How would you "read" this measurement?

Step by step:

1. Count the total number of subdivisions between the "9" and the "10." There are sixteen—right? Since what you're measuring falls between two lines, the denominator of the fraction part of the measurement will be twice the number of lines (2 x 16 = 32). Write that number "32" as the denominator of the fraction part of the measurement $\frac{\quad}{32}$.
2. Count the number of whole inches. In this measurement, we have 9 complete inches and part of 10 inches. Write "9" for this whole number part of the measurement $9\frac{\quad}{32}$.

3. Identify the sixteenths immediately before and after the unknown fraction:

   $9\frac{11}{16}$ $9\frac{?}{32}$ $9\frac{12}{16}$.

4. Express all fractions in thirty-seconds: $\frac{11}{16} \times \frac{2}{2} = \frac{22}{32}$ $\frac{12}{16} \times \frac{2}{2} = \frac{24}{32}$

5. Fill in the missing number: $9\frac{22}{32}$ $9\frac{?}{32}$ $9\frac{24}{32}$ $9\frac{22}{32}$ $9\frac{23}{32}$ $9\frac{24}{32}$.

The measure of the length on the tape is $9\frac{23}{32}$ inches.

SHORTCUT: T***o find the denominator, double the number of lines (16 x 2 = 32); to find the numerator, add the lines that come before and after (11 + 12 = 23).***

How to "Read" a Ruler

How would you "read" this measurement?

Step by step:

6. Count the total number of subdivisions between the "7" and the "8." There are thirty-two—right? Since what you're measuring falls between two lines, the denominator of the fraction part of the measurement will be twice the number of lines (2 x 32 = 64). Write that number "64" as the denominator of the fraction part of the measurement $\frac{\quad}{64}$.
7. Count the number of whole inches. In this measurement, we have 7 complete inches and part of 8 inches. Write "7" for this whole number part of the measurement $7\frac{\quad}{64}$.

8. Identify the thirty-seconds immediately before and after the unknown fraction: $7\frac{5}{32}$ $7\frac{?}{64}$ $7\frac{6}{32}$.

9. Express all fractions in sixty-fourths: $\frac{5}{32} \times \frac{2}{2} = \frac{10}{64}$ $\frac{6}{32} \times \frac{2}{2} = \frac{12}{64}$

10. Fill in the missing number: $7\frac{10}{64}$ $7\frac{?}{64}$ $7\frac{12}{64}$ $7\frac{10}{64}$ $7\frac{11}{64}$ $7\frac{12}{64}$.

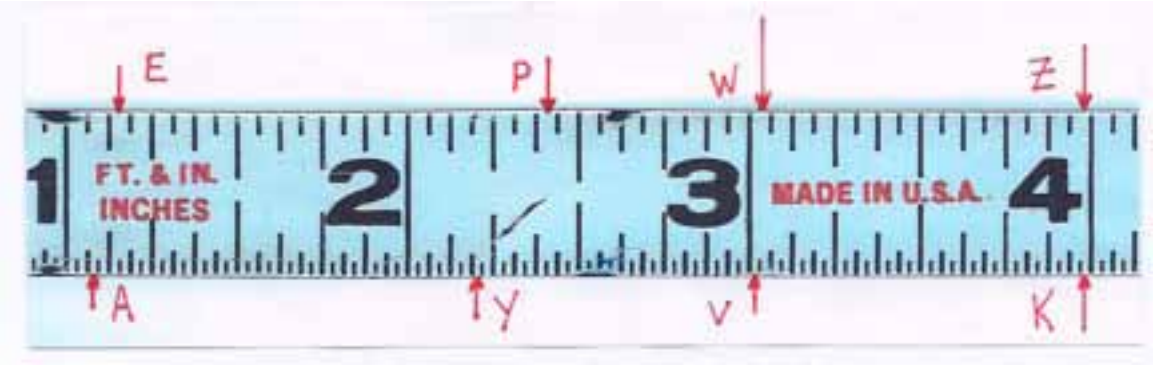
The measure of the length on the tape is $7\frac{11}{64}$ inches.

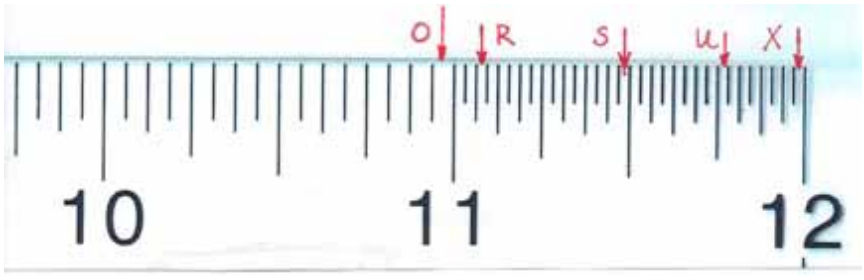
SHORTCUT: ***To find the denominator, double the number of lines (32 x 2 = 64); to find the numerator, add the lines that come before and after (5 + 6 = 11).***

How to "Read" a Ruler

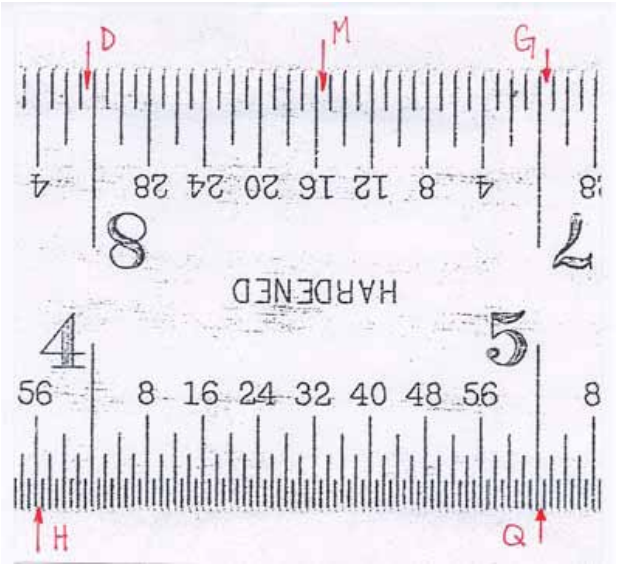
Part II

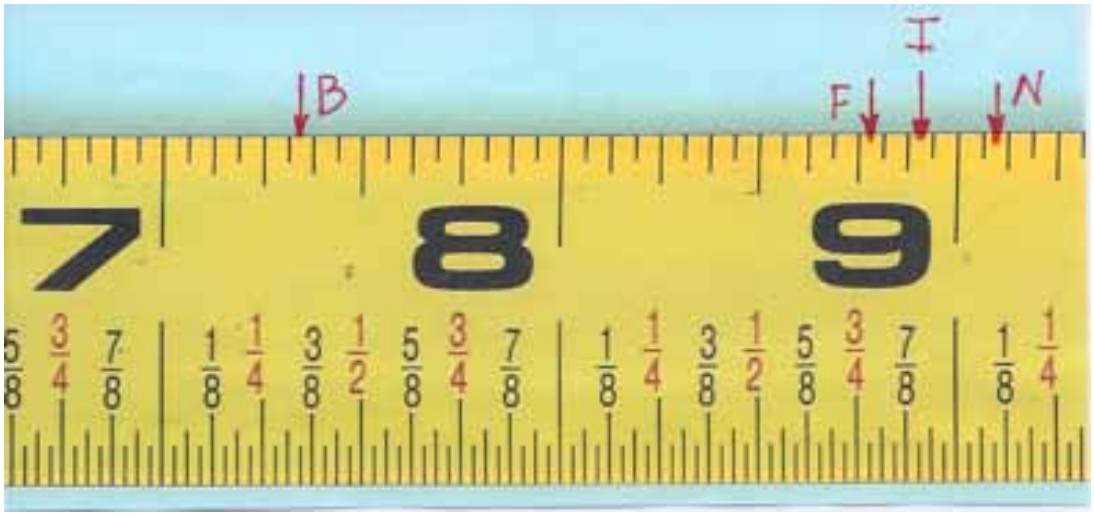
Identify the measurements given on the following inch rulers; record your answers in the answer sheet on page 22. Use the table at the end of the manual to reduce all fractions with even-number numerators to their lowest terms. (answers, page 23)





How to "Read" a Ruler





How to "Read" a Ruler

Part II Practice Exercises, Answer Sheet

A.	**N.**
B.	**O.**
C.	**P.**
D.	**Q.**
E.	**R.**
F.	**S.**
G.	**T.**
H.	**U.**
I.	**V.**
J.	**W.**
K.	**X.**
L.	**Y.**
M.	**Z.**

How to "Read" a Ruler

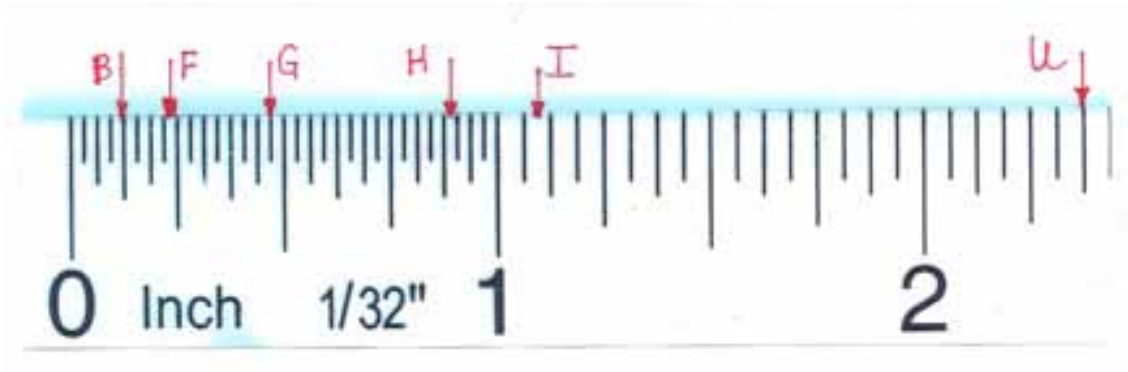
Part II Practice Exercises, Answer Key

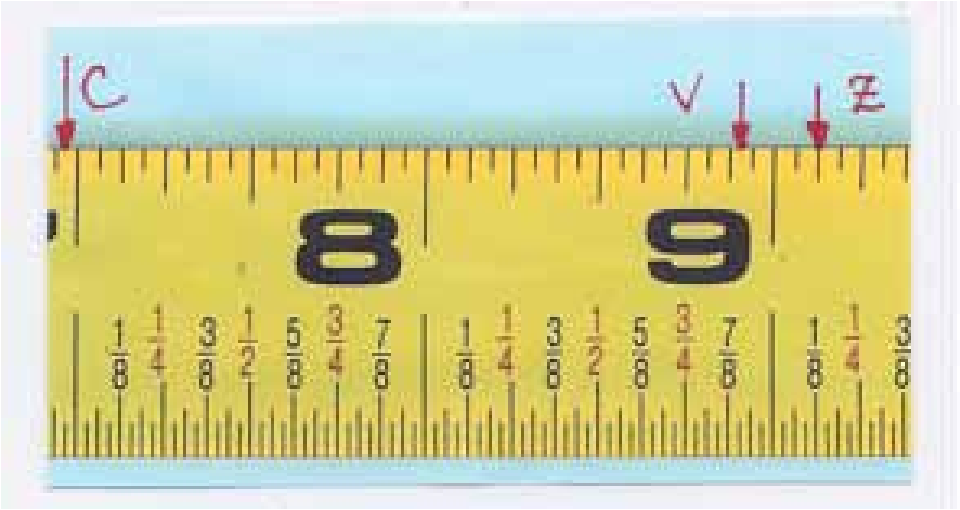
A.	$1\frac{5}{64}$	**N.**	$9\frac{3}{32}$
B.	$7\frac{11}{32}$	**O.**	$10\frac{31}{32}$
C.	$2\frac{15}{16}$	**P.**	$2\frac{13}{32}$
D.	$8\frac{1}{64}$	**Q.**	$5\frac{1}{128}$
E.	$1\frac{5}{32}$	**R.**	$11\frac{5}{64}$
F.	$8\frac{25}{32}$	**S.**	$11\frac{31}{64}$
G.	$6\frac{63}{64}$	**T.**	$5\frac{5}{16}$
H.	$3\frac{113}{128}$	**U.**	$11\frac{49}{64}$
I.	$8\frac{29}{32}$	**V.**	$3\frac{1}{64}$
J.	$1\frac{9}{16}$	**W.**	$3\frac{1}{32}$
K.	$3\frac{63}{64}$	**X.**	$11\frac{63}{64}$
L.	$4\frac{1}{16}$	**Y.**	$2\frac{13}{64}$
M.	$7\frac{31}{64}$	**Z.**	$3\frac{31}{32}$

How to "Read" a Ruler

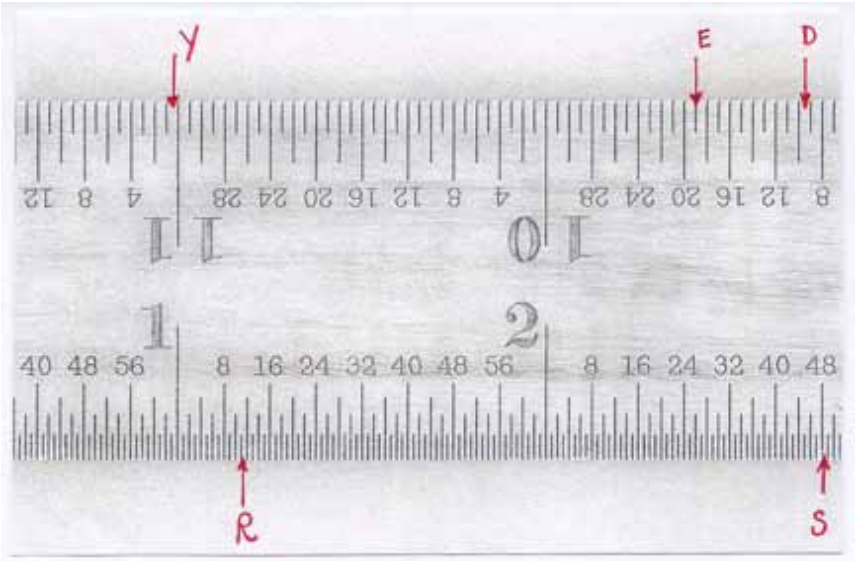
Part III "Reading" a ruler in any circumstance.

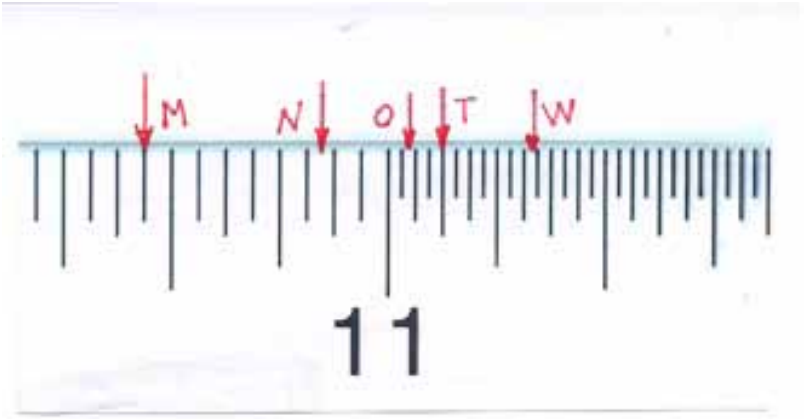
Identify the measurements given on the following inch rulers; record your answers in the answer sheet on page 26. Use the table at the end of the manual to reduce all fractions with even-number numerators to their lowest terms. (answers, page 27)

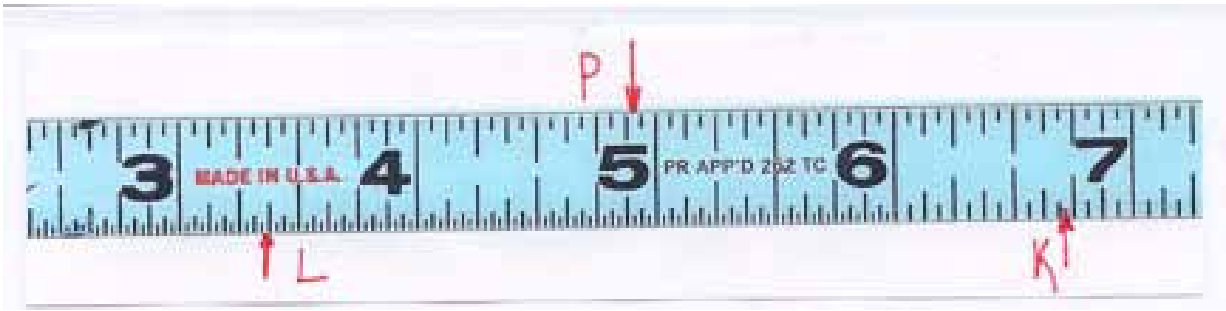




How to "Read" a Ruler







How to "Read" a Ruler

Part III Practice Exercises, Answer Sheet

A.	**N.**
B.	**O.**
C.	**P.**
D.	**Q.**
E.	**R.**
F.	**S.**
G.	**T.**
H.	**U.**
I.	**V.**
J.	**W.**
K.	**X.**
L.	**Y.**
M.	**Z.**

How to "Read" a Ruler

Part III Practice Exercises, Answer Key

A. $2\frac{3''}{8}$	**N.** $10\frac{27''}{32}$
B. $\frac{4''}{32} = \frac{1''}{8}$	**O.** $11\frac{3''}{64}$
C. $6\frac{31''}{32}$	**P.** $4\frac{29''}{32}$
D. $9\frac{19''}{64}$	**Q.** $4\frac{6''}{8} = 4\frac{3''}{4}$
E. $9\frac{19''}{32}$	**R.** $1\frac{23''}{128}$
F. $\frac{15''}{64}$	**S.** $2\frac{97''}{128}$
G. $\frac{15''}{32}$	**T.** $11\frac{4''}{32} = 11\frac{1''}{8}$
H. $\frac{57''}{64}$	**U.** $2\frac{6''}{16} = 2\frac{3''}{8}$
I. $1\frac{3''}{32}$	**V.** $8\frac{29''}{32}$
J. $3\frac{7''}{16}$	**W.** $11\frac{21''}{64}$
K. $6\frac{23''}{32}$	**X.** $5\frac{1''}{16}$
L. $3\frac{23''}{64}$	**Y.** $11\frac{1''}{64}$
M. $10\frac{7''}{16}$	**Z.** $9\frac{2''}{16} = 9\frac{1''}{8}$

How to "Read" a Ruler

Part IV Converting inches to feet and inches.

You will be expected to express measurements in excess of 12 inches as a combination of feet and inches.

To convert 43 inches to feet and inches, divide 43 by 12 (every foot has 12 inches): there are 3 complete feet [36 inches] and 7 inches left over.

Part IV Practice Exercises 1 Convert the following inches to feet and inches. (answers, page 29)

A. 17" = _____' _____"	**N.** 88" =_____' _____"
B. 21" = _____' _____"	**O.** 91" =_____' _____"
C. 29" = _____' _____"	**P.** 99" =_____' _____"
D. 35" =_____' _____"	**Q.** 102" =_____' _____"
E. 38" = _____' _____"	**R.** 109" =_____' _____"
F. 44" = _____' _____"	**S.** 111" =_____' _____"
G. 49" =_____' _____"	**T.** 117" =_____' _____"
H. 56" =_____' _____"	**U.** 123" =_____' _____"
I. 59" =_____' _____"	**V.** 129" =_____' _____"
J. 63" =_____' _____"	**W.** 133" =_____' _____"
K. 66" =_____' _____"	**X.** 135" =_____' _____"
L. 79" =_____' _____"	**Y.** 149" =_____' _____"
M. 81" =_____' _____"	**Z.** 155" =_____' _____"

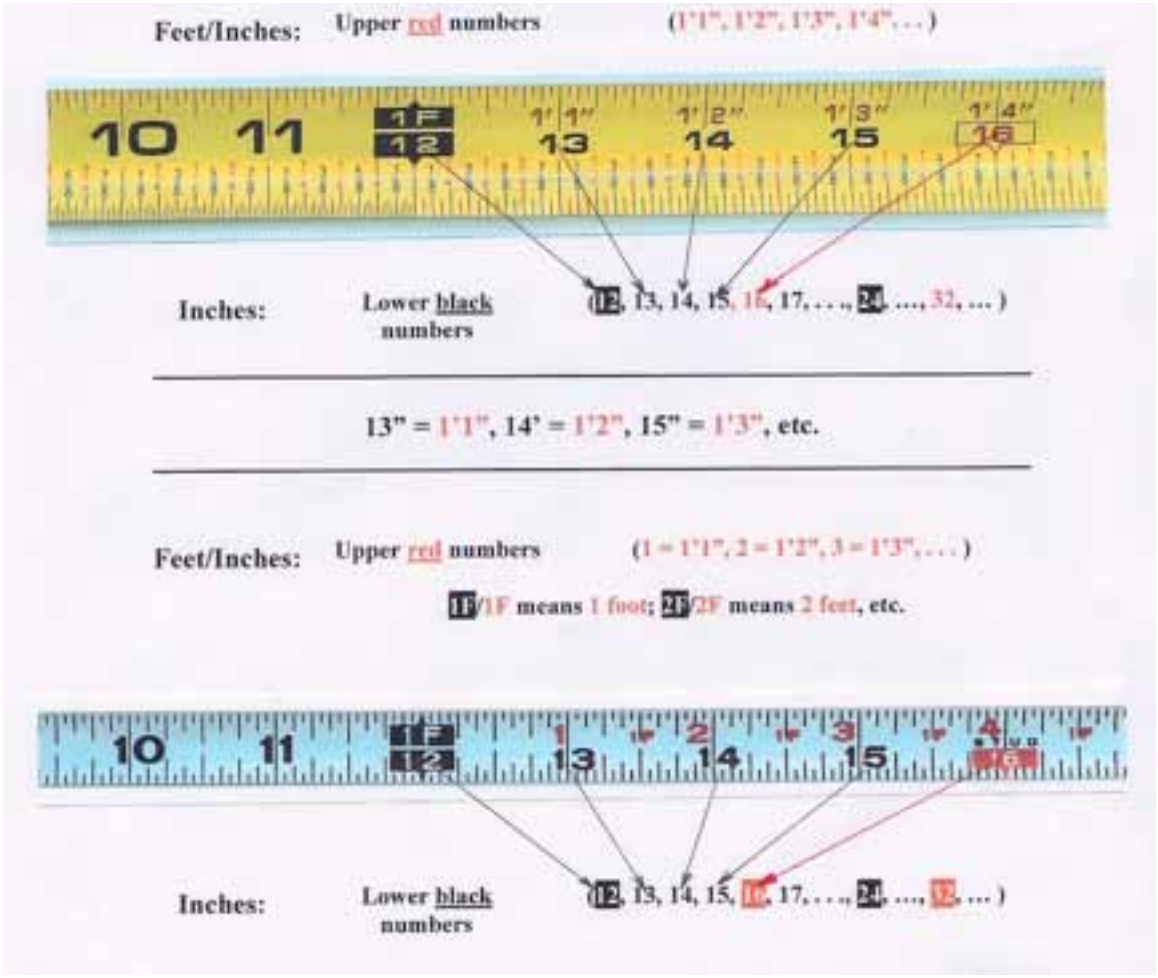
How to "Read" a Ruler

Part IV Practice Exercises 1, Answer Key

A. 17" = 1 ' 5 "	N. 88" = 7 ' 4 "
B. 21" = 1 ' 9 "	O. 91" = 7 ' 7 "
C. 29" = 2 ' 5 "	P. 99" = 8 ' 3 "
D. 35" = 2 ' 11 "	Q. 102" = 8 ' 6 "
E. 38" = 3 ' 2 "	R. 109" = 9 ' 1 "
F. 44" = 3 ' 8 "	S. 111" = 9 ' 3 "
G. 49" = 4 ' 1 "	T. 117" = 9 ' 9 "
H. 56" = 4 ' 8 "	U. 123" = 10 ' 3 "
I. 59" = 4 ' 11 "	V. 129" = 10 ' 9 "
J. 63" = 5 ' 3 "	W. 133" = 11 ' 1 "
K. 66" = 5 ' 6 "	X. 135" = 11 ' 3 "
L. 79" = 6 ' 7 "	Y. 149" = 12 ' 5 "
M. 81" = 6 ' 9 "	Z. 155" = 12 ' 11 "

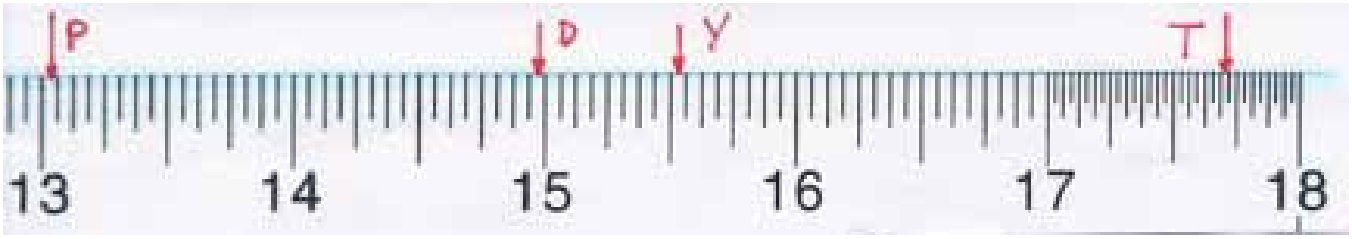
How to "Read" a Ruler

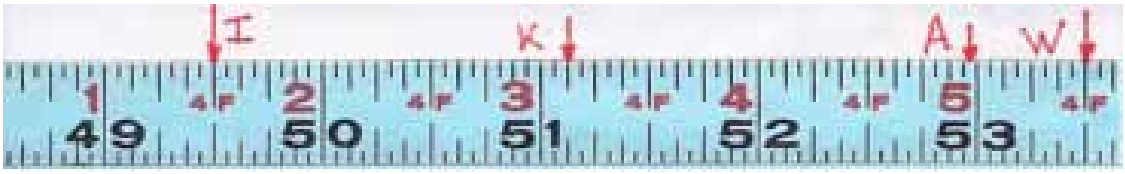
Look at portions of two professional measuring tapes illustrated below. Notice that beyond 12 inches (1 foot), both inch dimensions and mixed feet-inch dimensions are shown. Make sure you understand the difference.

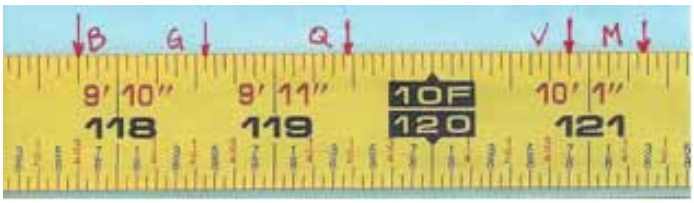


How to "Read" a Ruler

Part IV Practice Exercises 2 Identify the measurements given on the following inch rulers; record your answers, in feet and inches, in the answer sheet on page 32. (For example, $41\frac{17''}{32}$ is, actually, 3′-05 $\frac{17''}{32}$. Notice that the fraction stays the same when inches are converted to feet and inches.) Use the table at the end of the manual to reduce all fractions with even-number numerators to their lowest terms. Remember to use hatch marks; a single hatch mark indicates feet and a double hatch mark indicates inches. (answers, page 33)







How to "Read" a Ruler

Part IV Practice Exercises 2, Answer Sheet

A.	**N.**
B.	**O.**
C.	**P.**
D.	**Q.**
E.	**R.**
F.	**S.**
G.	**T.**
H.	**U.**
I.	**V.**
J.	**W.**
K.	**X.**
L.	**Y.**
M.	**Z.**

How to "Read" a Ruler

Part IV Practice Exercises 2, Answer Key

A. 4'-04 31/32"	N. 4'-04 15/16"
B. 9'-09 12/16" = 9'-09 3/4"	O. 11'-08 13/16"
C. 6'-01 7/32"	P. 1'-01 1/32"
D. 1'-02 31/32"	Q. 9'-11 15/32"
E. 11'-11 9/16"	R. 11'-10 27/32"
F. 4'-01 9/16"	S. 5'-11 27/32"
G. 9'-10 9/16"	T. 1'-05 45/64"
H. 11'-07 10/16" = 11'-07 5/8"	U. 12'-00 11/32"
I. 4'-01 8/16" = 4'-01 1/2"	V. 10'-00 7/8"
J. 6'-02 13/16"	W. 4'-05 8/16" = 4'-05 1/2"
K. 4'-03 2/16" = 4'-03 1/8"	X. 4'-05 4/8" = 4-'05 1/2"
L. 4'-03 2/8" = 4'-03 1/4"	Y. 1'-03 17/32"
M. 10'-01 11/32"	Z. 6'-00 21/32"

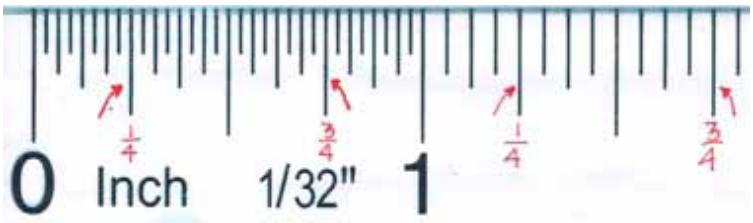
How to "Read" a Ruler

Part V Identifying the lines of a ruler.

No matter what the scale of a ruler (eighths, sixteenths, thirty-seconds, etc.), the longest lines are always those that indicate the whole inches:

Between any two inch lines, the longest line is the half-inch line:

The next two longest lines are the quarter-inch lines:



(Now, you may be wondering: what happened to $\frac{2}{4}$? Well, if you reduce $\frac{2}{4}$ to its lowest terms, $\frac{1}{2}$, you'll remember that you've already identified the half-inch line.)

How to "Read" a Ruler

The next four longest lines are the eighth-inch lines:

(Now, you may be wondering: what happened to $\frac{2}{8}$, $\frac{4}{8}$ and $\frac{6}{8}$? Well, if you reduce them to their lowest terms, $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$, you'll remember that you've already identified the half- and quarter-inch lines.)

The next eight longest lines are the sixteenth-inch lines:

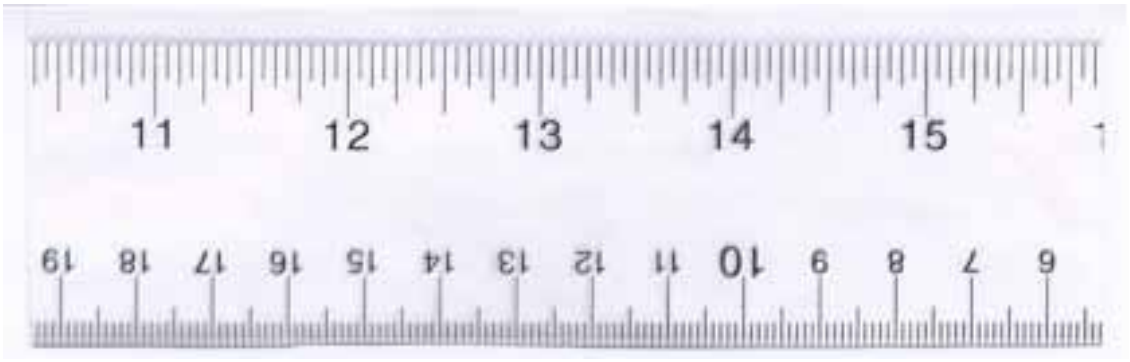
(Now, you may be wondering: what happened to $\frac{2}{16}$, $\frac{4}{16}$, $\frac{6}{16}$, $\frac{8}{16}$, $\frac{10}{16}$, $\frac{12}{16}$ and $\frac{14}{16}$? Well, if you reduce them to their lowest terms, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$ and $\frac{7}{8}$, you'll remember that you've already identified the half-, quarter- and eighth-inch lines.)

This pattern repeats itself with every scale of inch ruler. As you use rulers and professional measuring tapes more and more, you'll automatically associate certain fractions with certain lines.

How to "Read" a Ruler

Part V Practice Exercises 1

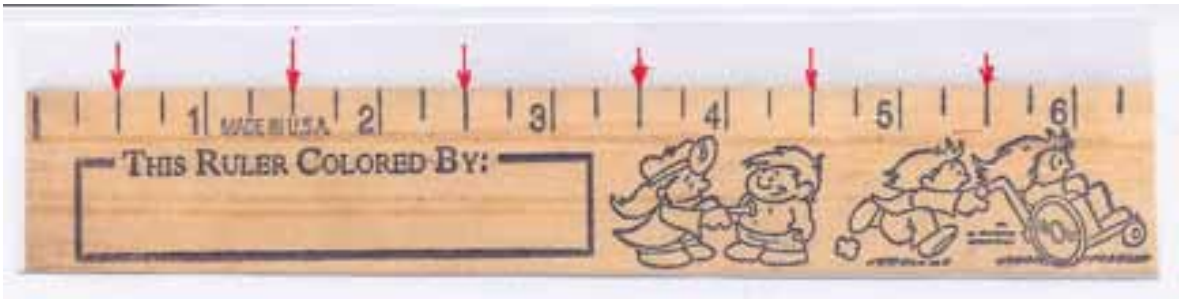
Identify all the half-inch lines on the following rulers or measuring tapes. (answers, page 37)

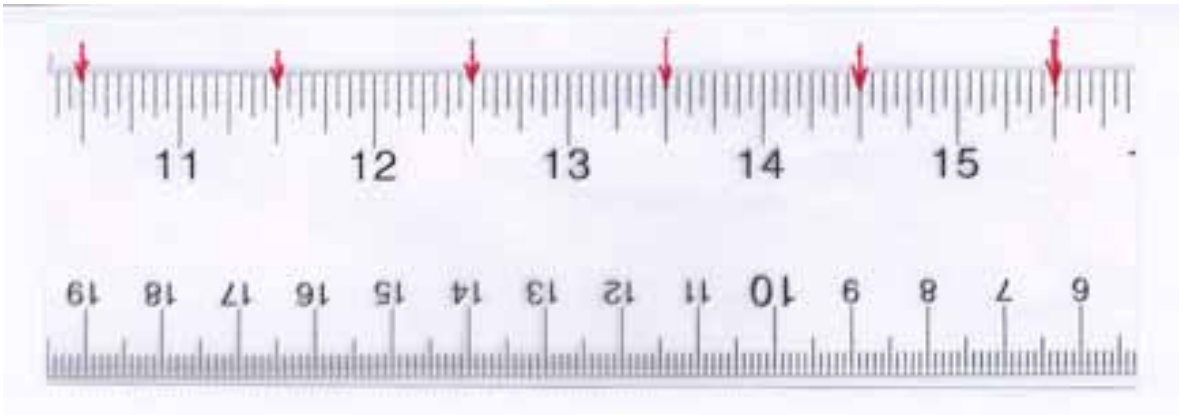


How to "Read" a Ruler

Part V Practice Exercises 1, Answer Key

Identify all the half-inch lines on the following rulers or measuring tapes.

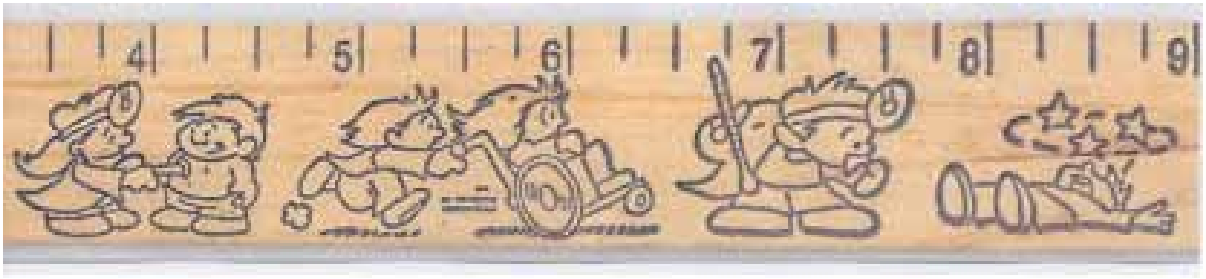


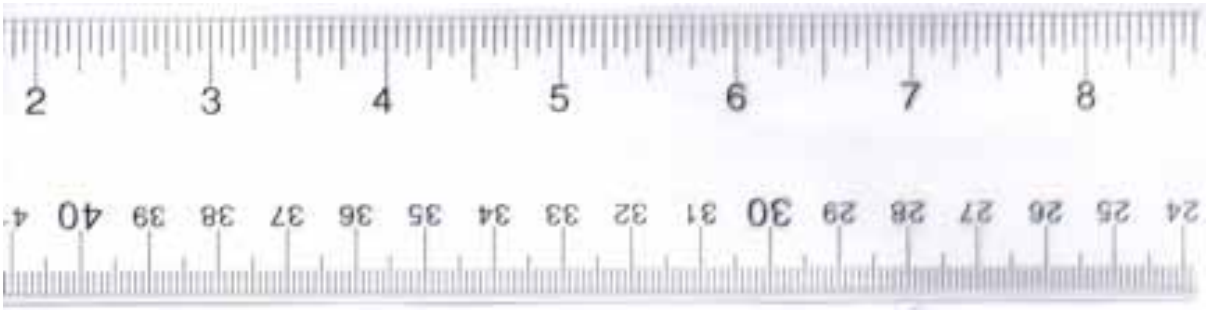


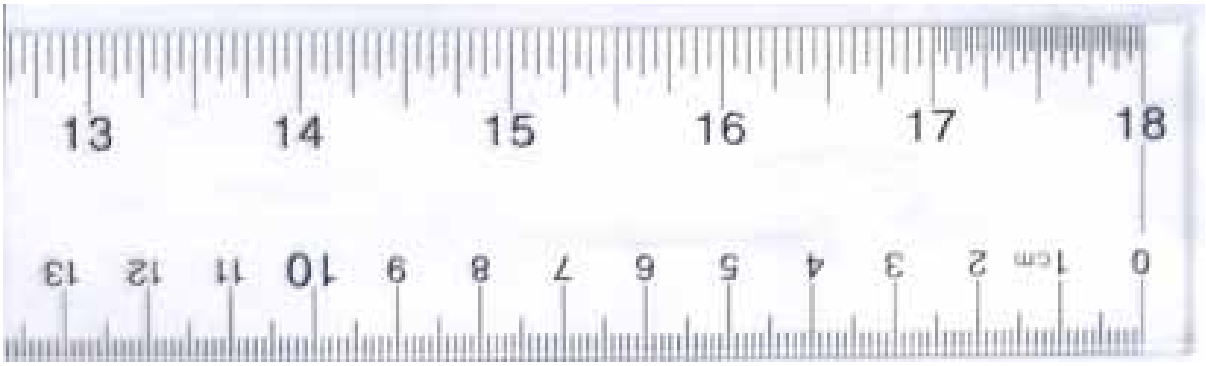
How to "Read" a Ruler

Part V Practice Exercises 2

Identify all the quarter-inch lines on the following rulers or measuring tapes. (answers, page 39)



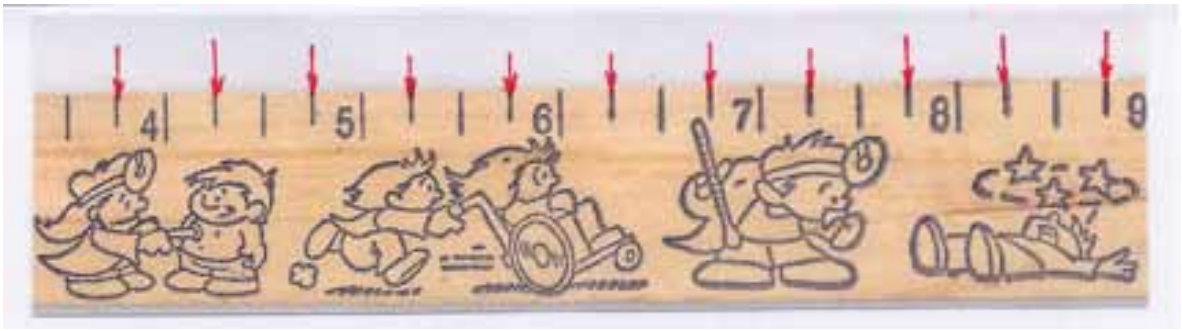


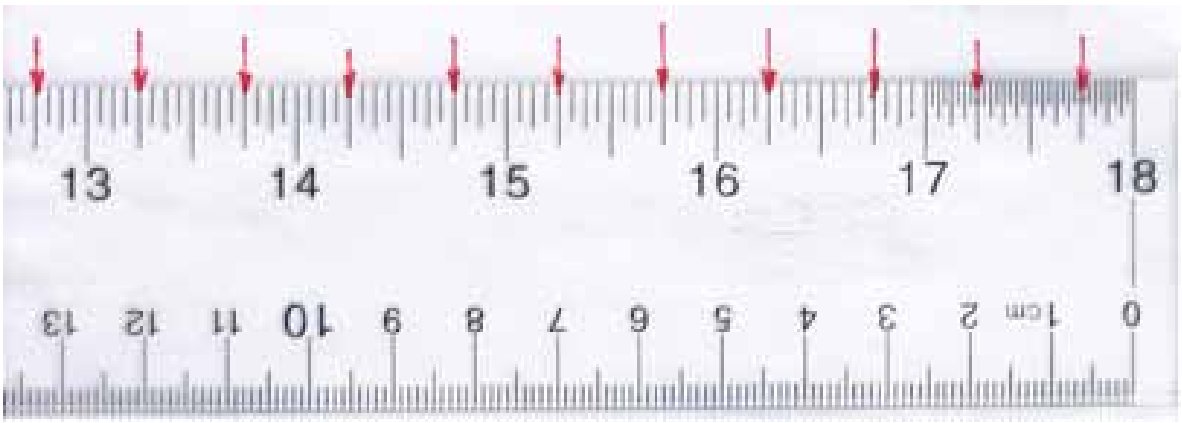


How to "Read" a Ruler

Part V Practice Exercises 2, Answer Key

Identify all the quarter-inch lines on the following rulers or measuring tapes.





How to "Read" a Ruler

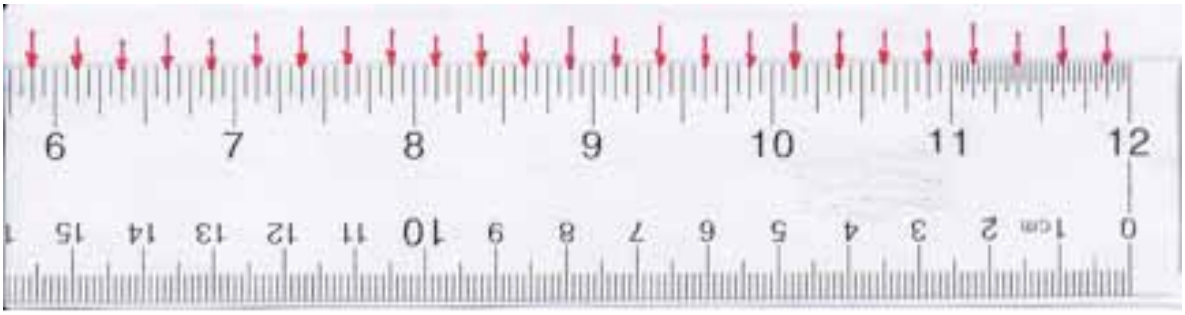
Part V Practice Exercises 3

Identify all the eighth-inch lines on the following rulers or measuring tapes. (answers, page 41)

How to "Read" a Ruler

Part V Practice Exercises 3, Answer Key

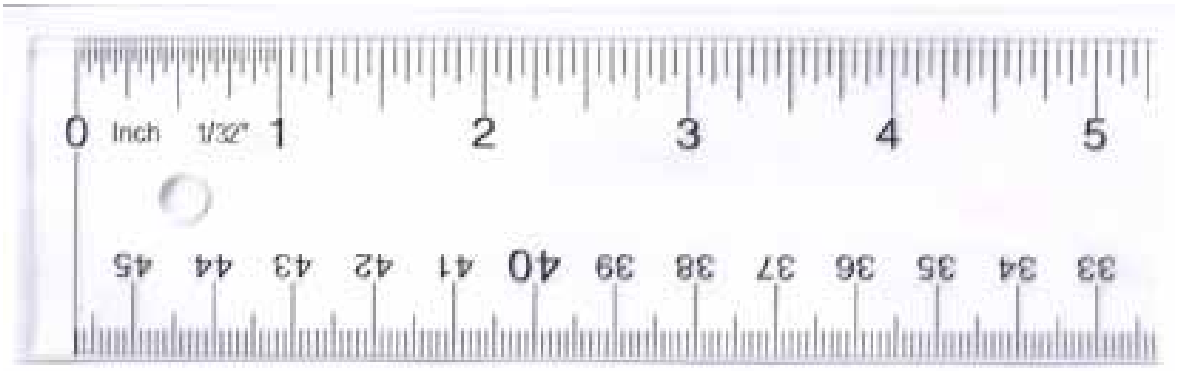
Identify all the eighth-inch lines on the following rulers or measuring tapes.

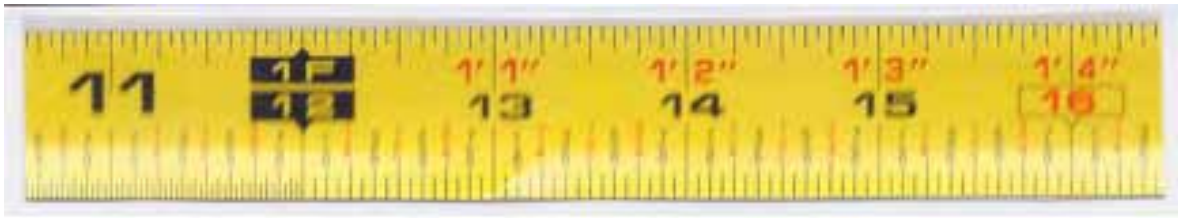


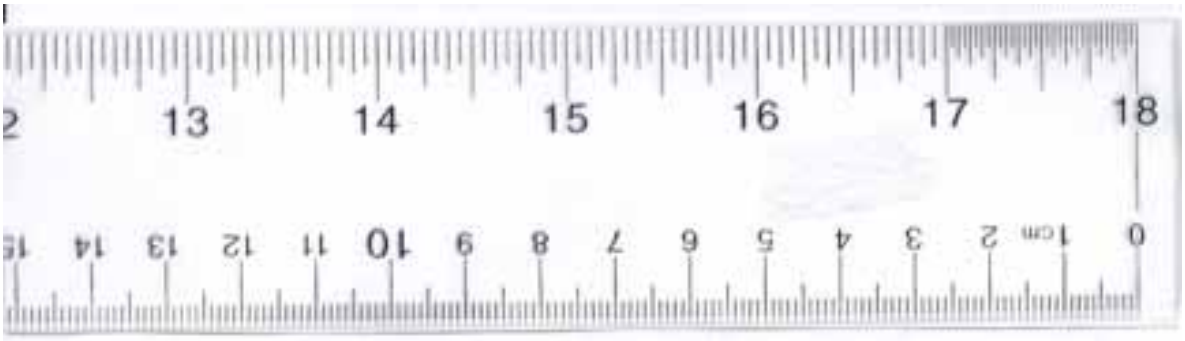
How to "Read" a Ruler

Part V Practice Exercises 4

Identify all the sixteenth-inch lines on the following rulers or measuring tapes. (answers, page 43)



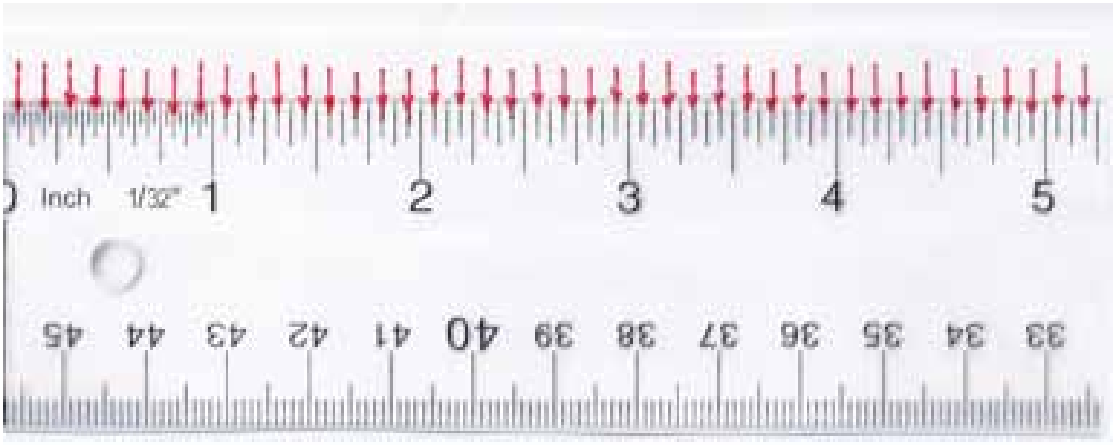


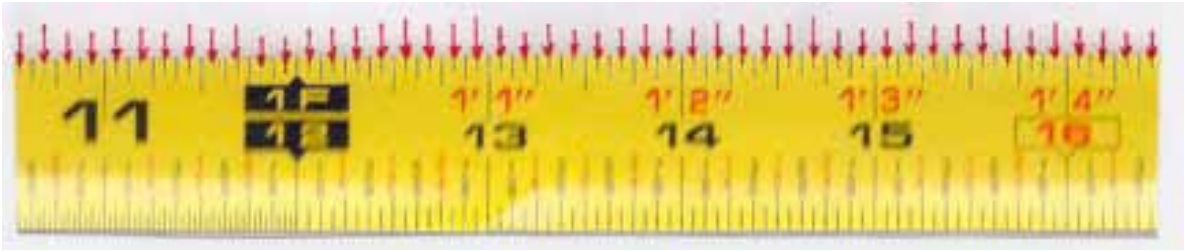


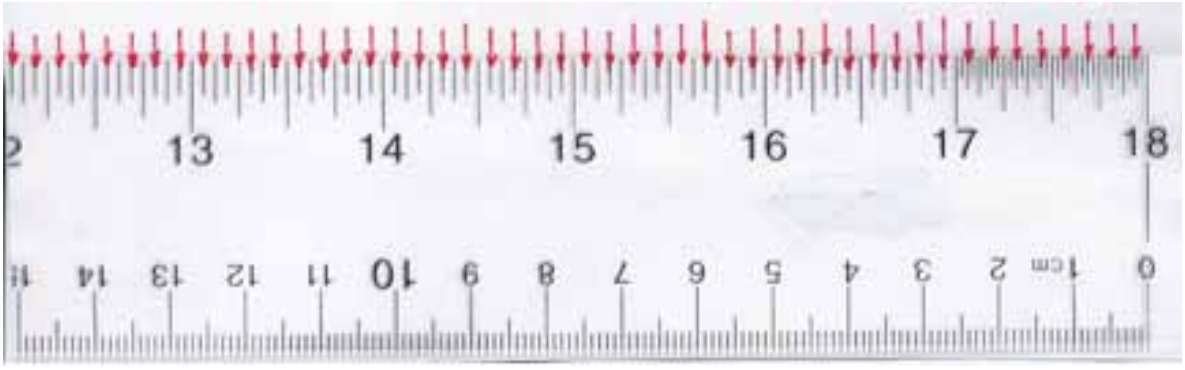
How to "Read" a Ruler

Part V Practice Exercises 4, Answer Key

Identify all the sixteenth-inch lines on the following rulers or measuring tapes.



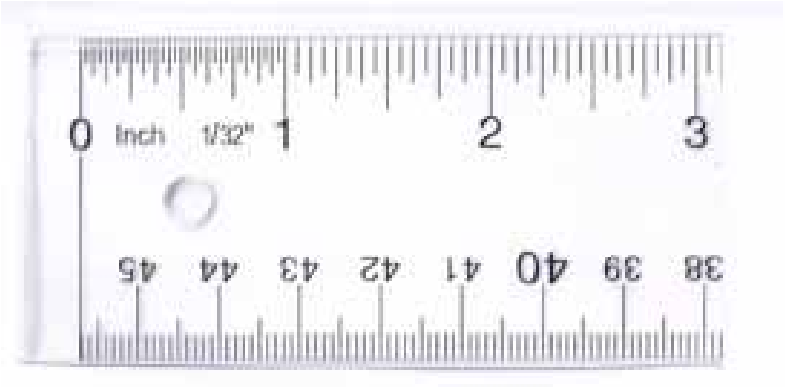


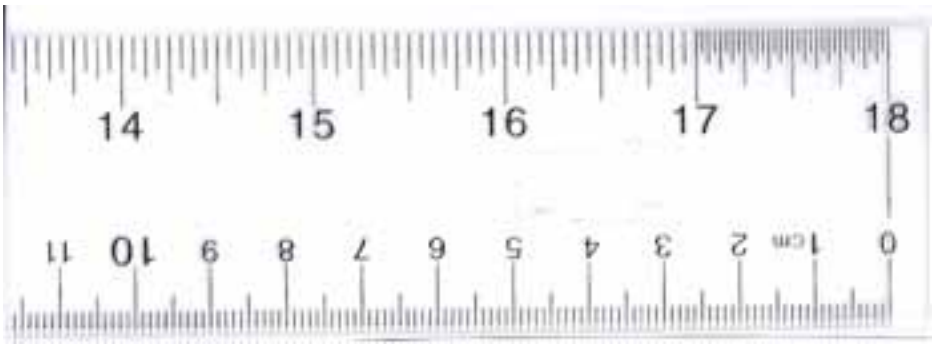


How to "Read" a Ruler

Part V Practice Exercises 5

Identify all the thirty-second-inch lines on the following rulers or measuring tapes. (answers, page 45)

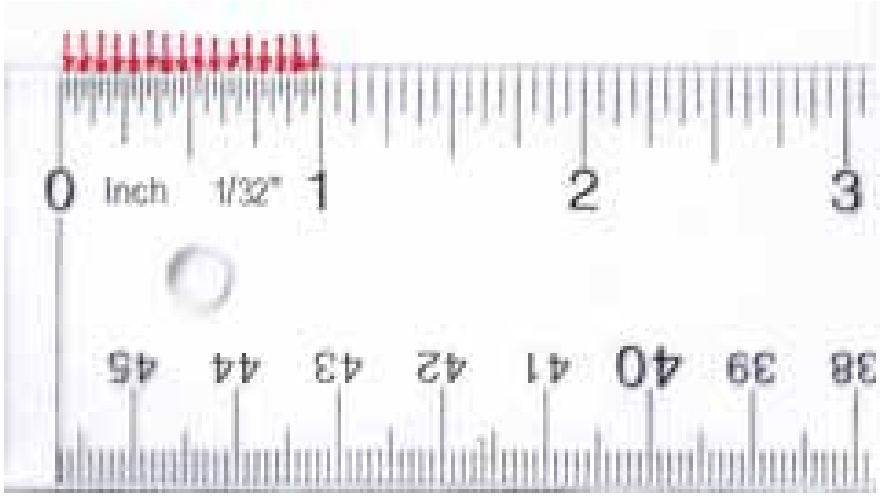


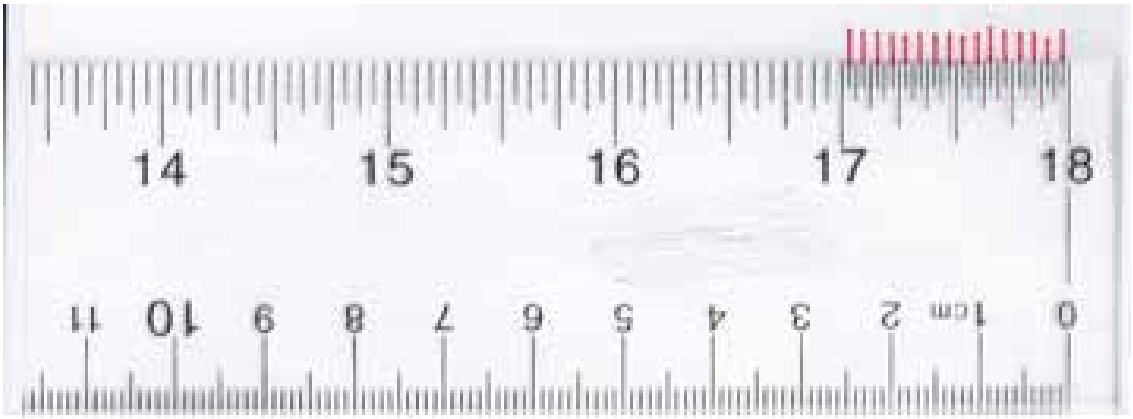


How to "Read" a Ruler

Part V Practice Exercises 5, Answer Key

Identify all the thirty-second-inch lines on the following rulers or measuring tapes.





How to "Read" a Ruler

TABLE: REDUCED FRACTIONS

64	32	16	8	4	2
$\frac{2}{64}$	$\frac{1}{32}$				
$\frac{4}{64}$	$\frac{2}{32}$	$\frac{1}{16}$			
$\frac{6}{64}$	$\frac{3}{32}$				
$\frac{8}{64}$	$\frac{4}{32}$	$\frac{2}{16}$	$\frac{1}{8}$		
$\frac{10}{64}$	$\frac{5}{32}$				
$\frac{12}{64}$	$\frac{6}{32}$	$\frac{3}{16}$			
$\frac{14}{64}$	$\frac{7}{32}$				
$\frac{16}{64}$	$\frac{8}{32}$	$\frac{4}{16}$	$\frac{2}{8}$	$\frac{1}{4}$	
$\frac{18}{64}$	$\frac{9}{32}$				
$\frac{20}{64}$	$\frac{10}{32}$	$\frac{5}{16}$			
$\frac{22}{64}$	$\frac{11}{32}$				
$\frac{24}{64}$	$\frac{12}{32}$	$\frac{6}{16}$	$\frac{3}{8}$		
$\frac{26}{64}$	$\frac{13}{32}$				
$\frac{28}{64}$	$\frac{14}{32}$	$\frac{7}{16}$			
$\frac{30}{64}$	$\frac{15}{32}$				
$\frac{32}{64}$	$\frac{16}{32}$	$\frac{8}{16}$	$\frac{4}{8}$	$\frac{2}{4}$	$\frac{1}{2}$

How to "Read" a Ruler

TABLE: REDUCED FRACTIONS

64	32	16	8	4	2
34/64	17/32				
36/64	18/32	9/16			
38/64	19/32				
40/64	20/32	10/16	5/8		
42/64	21/32				
44/64	22/32	11/16			
46/64	23/32				
48/64	24/32	12/16	6/8	3/4	
50/64	25/32				
52/64	26/32	13/16			
54/64	27/32				
56/64	28/32	14/16	7/8		
58/64	29/32				
60/64	30/32	15/16			
62/64	31/32				