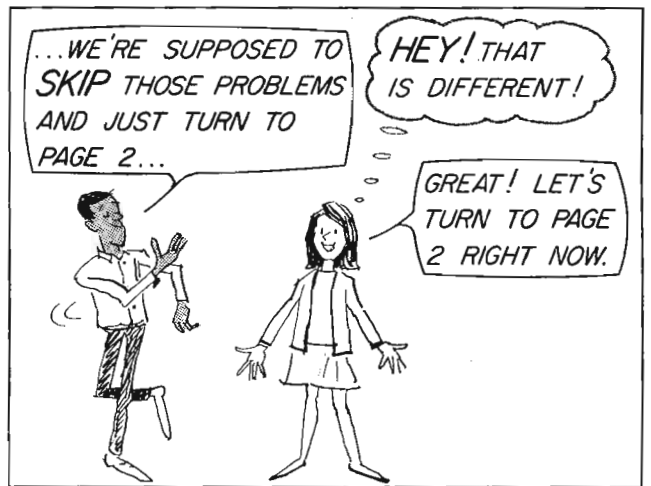
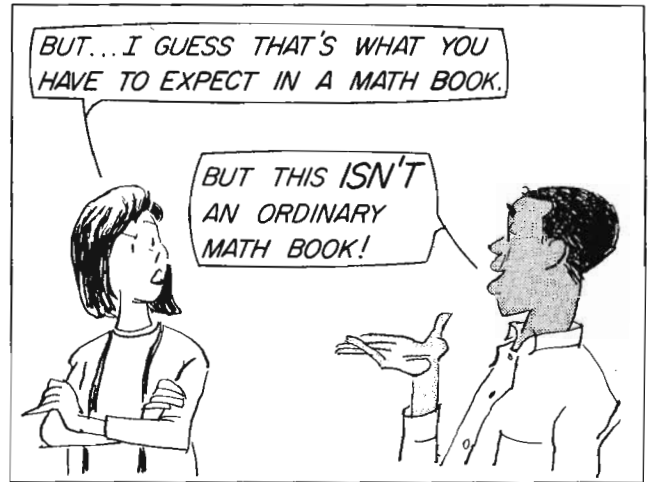
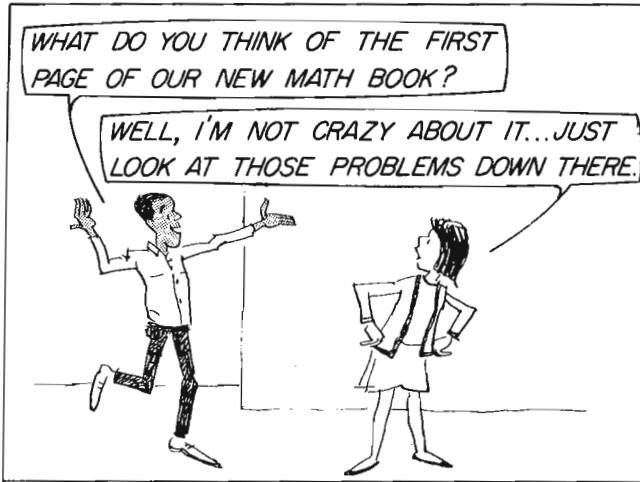


TEXT
511
HARRO
1969

EDL

CHAPTER 1: STRETCHING MACHINES



1. Add:
$$\begin{array}{r} 3.407 \\ 5.65 \\ +3.278 \\ \hline \end{array}$$

2. Subtract:
$$\begin{array}{r} 345.2 \\ - 27.73 \\ \hline \end{array}$$

3. Multiply:
$$\begin{array}{r} 437.2 \\ \times 2.98 \\ \hline \end{array}$$

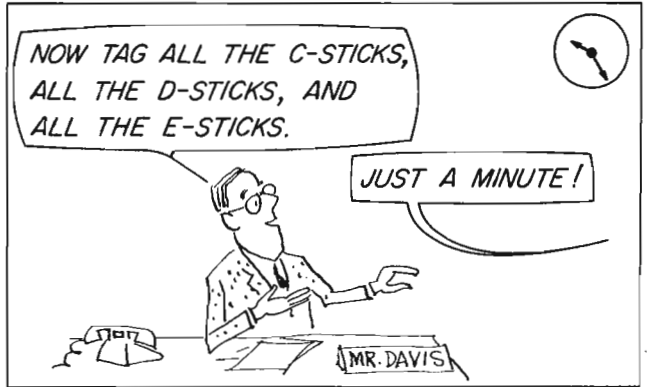
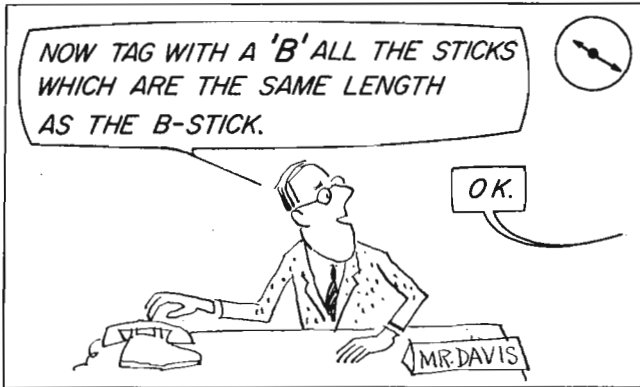
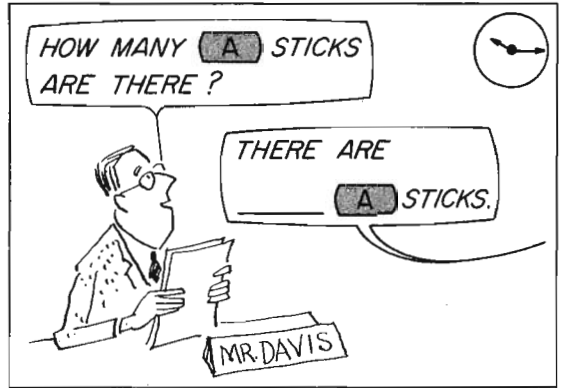
4. Add:
$$\frac{3}{14} + \frac{2}{9} =$$

5. Multiply:
$$\frac{3}{2} \times \frac{38}{13} =$$

6. Complete:
$$42\% \text{ of } \$35.20 =$$

7. Divide:
$$\frac{4}{9} \div \frac{3}{8} =$$

8. Divide:
$$1.9 \overline{)348.72}$$

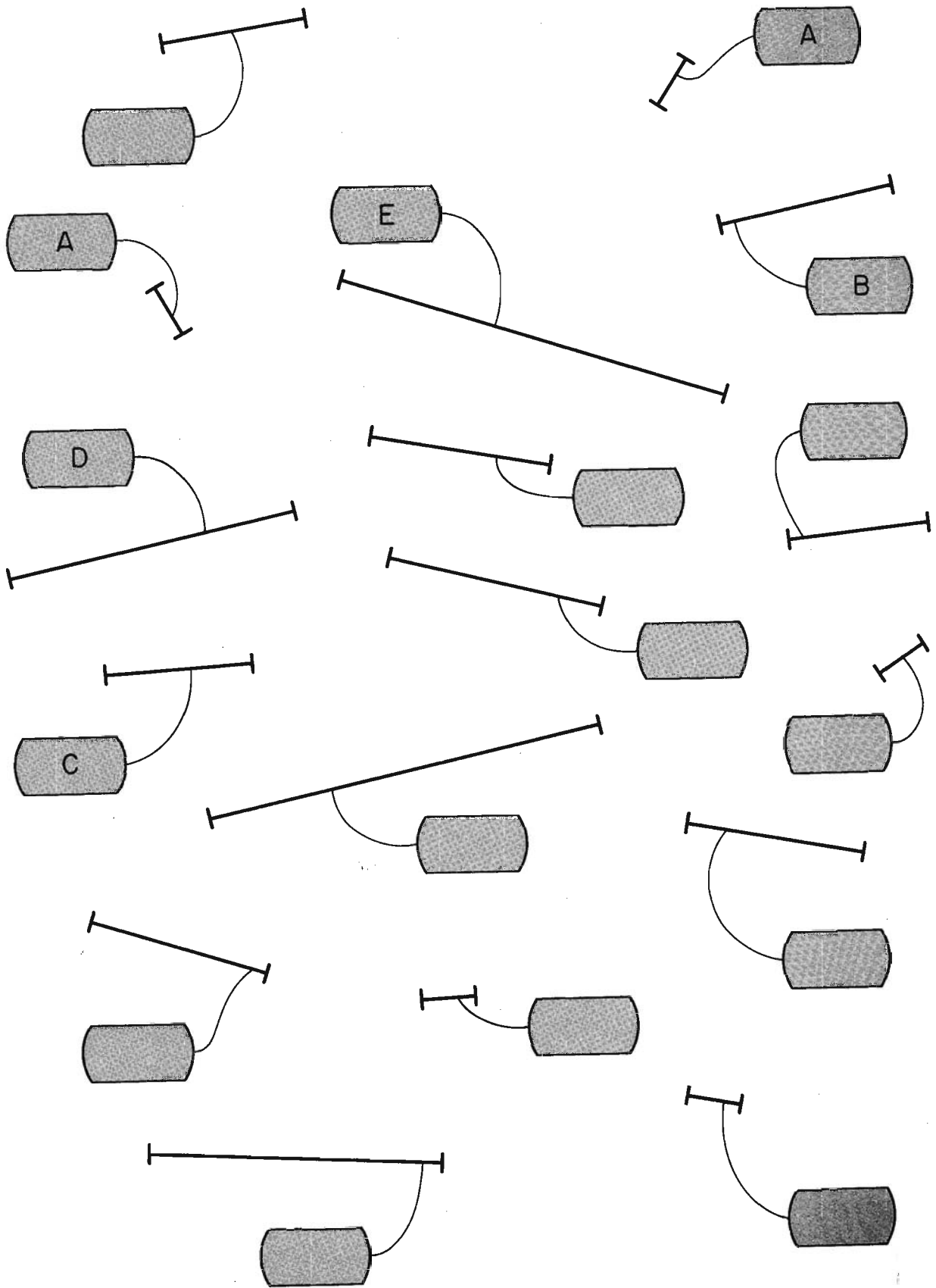


Now finish the table.

LENGTH	NUMBER OF STICKS
A	
B	
C	
D	
E	
TOTAL	

The total number of sticks on page 3 is _____.

How long did it take Mr. Davis and Jim to do the labeling job? _____

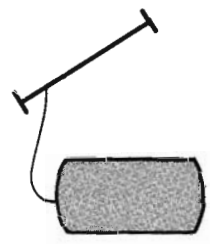
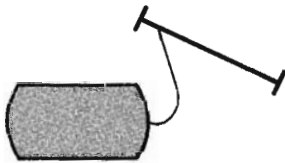
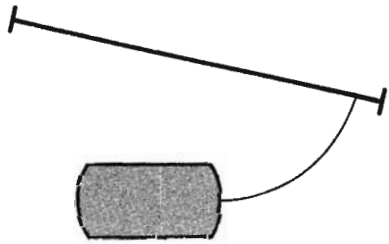
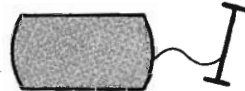
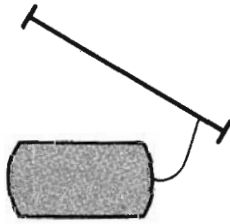
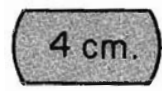
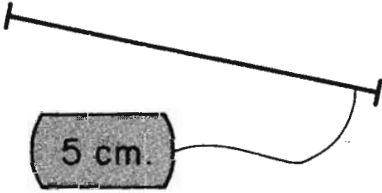
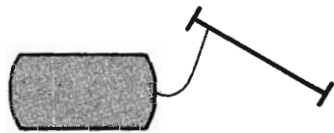
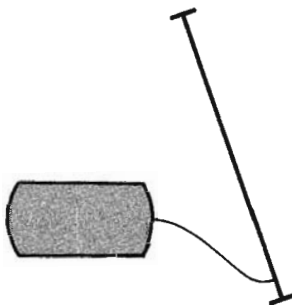
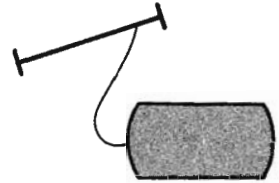
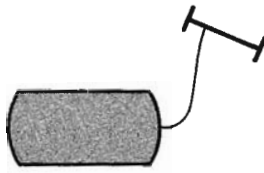
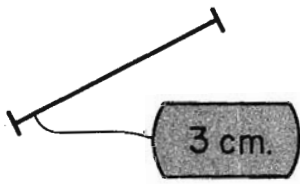
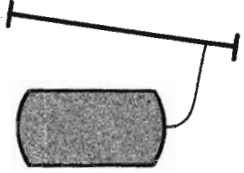
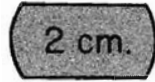
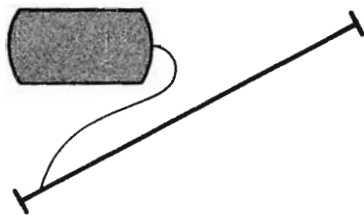


PLEASE FINISH THE LABELING JOB FOR THIS PAGE. USE THE FILLED IN LABELS TO HELP YOU.



WHAT DOES 'cm.' MEAN?

'cm.' IS AN ABBREVIATION OF CENTIMETER.



1.

PLEASE FINISH THE TABLE.

GET YOUR INFORMATION FROM PAGE 4.

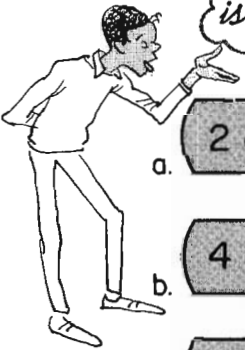


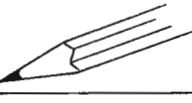
LENGTH	NUMBER OF STICKS
1 cm.	
2 cm.	
3 cm.	
4 cm.	
5 cm.	
TOTAL	

2.

FILL THE BLANKS.

is shorter than ... is the same length as ... is longer than



- a. 2 cm. _____ is shorter than  5 cm.
- b. 4 cm. _____ 3 cm.
- c. 2 cm. _____ 2 cm.
- d. 5 cm. _____ 3 cm.
- e. 8 cm. _____ 10 cm.

3.

DRAW A STICK WHICH IS 8 CENTIMETERS LONG.

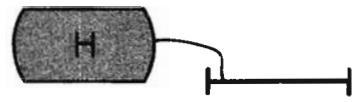


8 cm.





HERE IS AN H-STICK.




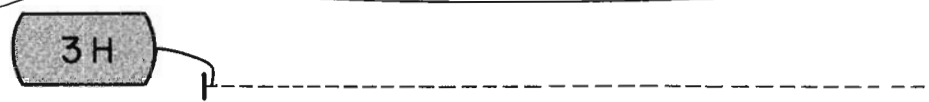
DRAW A 2H-STICK.







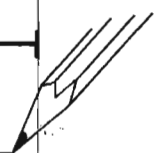



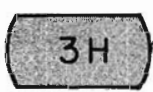

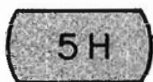

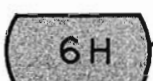

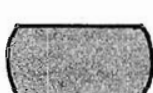
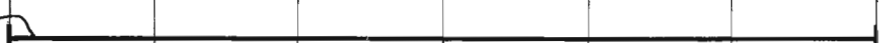
FILL IN THE TAG.



NOW, DRAW A STICK WHICH IS 3 TIMES AS LONG AS .



7. Draw sticks to match the tags. Also fill in the tags.

								
a.								
b.								
c.								
d.								
e.								
f.								

8. Please draw sticks to match the tags, and fill in the blank tags.

11
10
9
8
7
6
5
4
3
2
1
0

a. 5T
b. 2T
c.
d.
e. 6T
f.
7

154
511
13480
13480

FDL

ADVANCE PRINTING

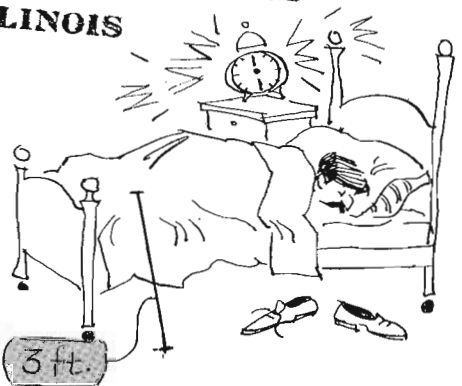
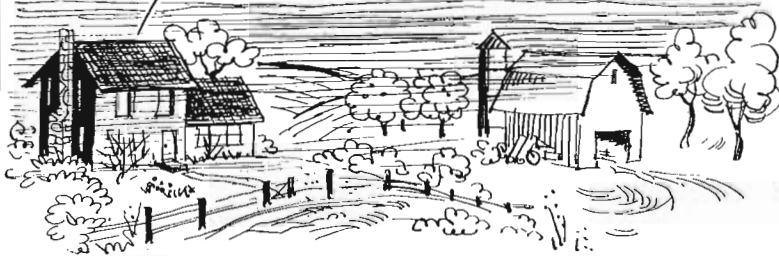
HARPER & ROW, PUBLISHERS

CHAPTER 1: APPROXIMATIONS

One evening on Mr. Miller's farm...

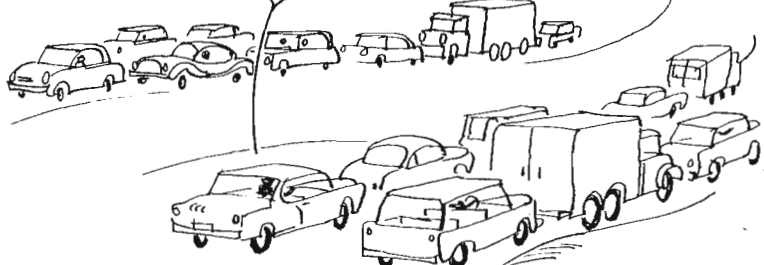
EVANSTON, ILLINOIS

I'D BETTER GO TO BED EARLY TONIGHT... TOMORROW I HAVE TO GO DOWN TO THE ZABRANCHBURG STRETCH FACTORY.



WOW! I'M ONLY HALFWAY TO ZABRANCHBURG AND ALREADY THE ROAD IS CROWDED.

ZABRANCHBURG 20 MILES



BURGTORY

WE CAN DO ANY STRETCHING JOB



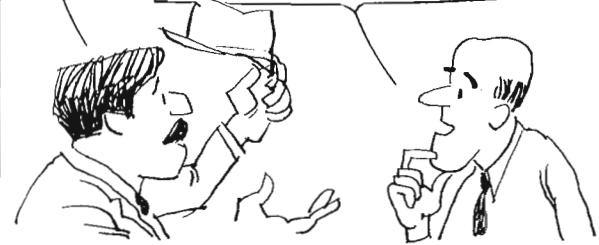
I'D LIKE THIS 3-FOOT STICK STRETCHED TO 7 FEET, PLEASE.

3 FEET TO 7 FEET? I'M SORRY, SIR. WE CAN'T DO THAT JOB.



WHY NOT?

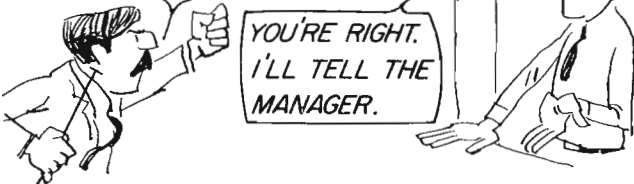
WELL, YOU SEE... A 2-MACHINE WON'T STRETCH THE 3-FOOT STICK ENOUGH AND A 3-MACHINE WOULD STRETCH IT TOO MUCH.



BUT YOUR SIGN SAYS YOU CAN DO ANY STRETCHING JOB.

YOU TAKE THAT SIGN DOWN OR I'LL COMPLAIN TO THE BETTER BUSINESS BUREAU.

YOU'RE RIGHT. I'LL TELL THE MANAGER.

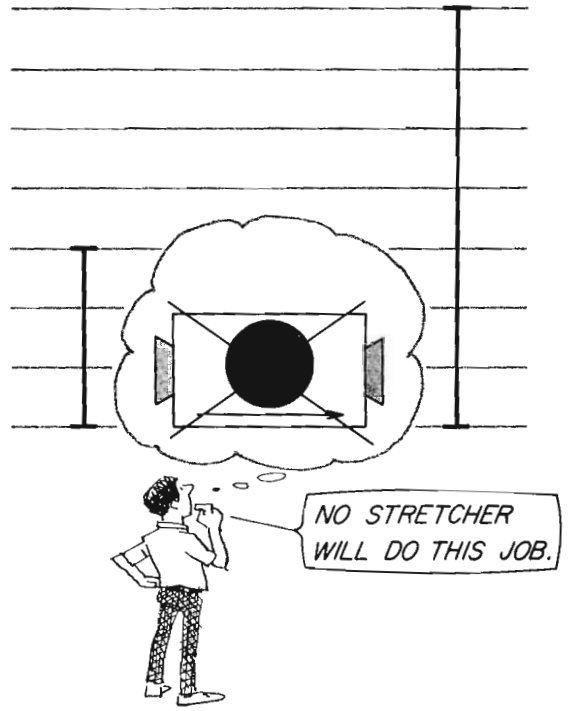
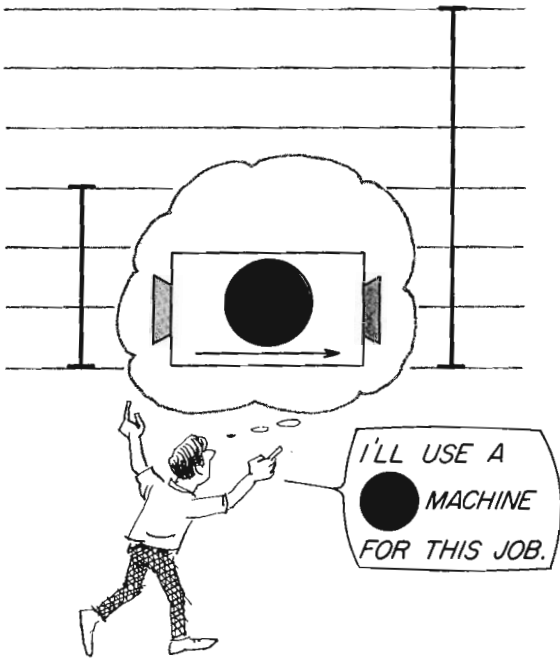


GOT A STRETCHING JOB? TRY US FIRST!

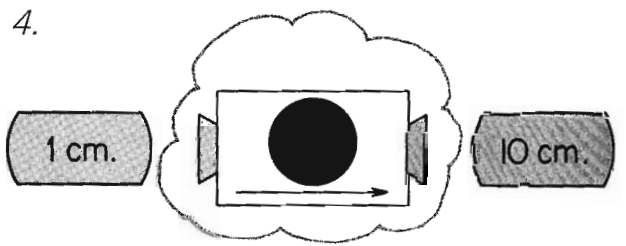
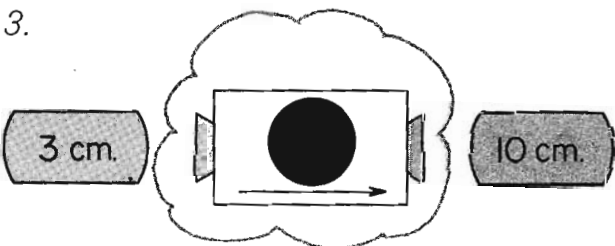
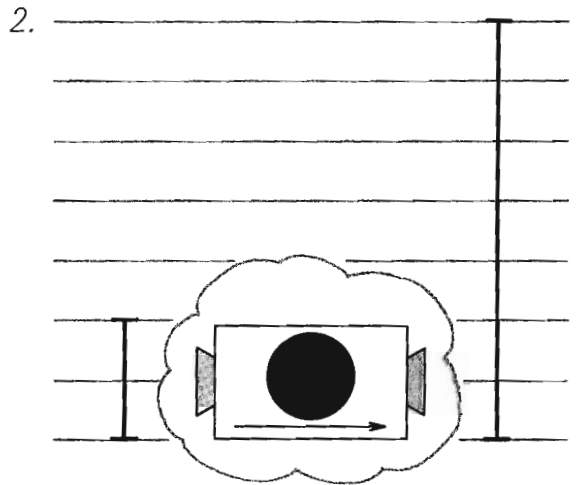
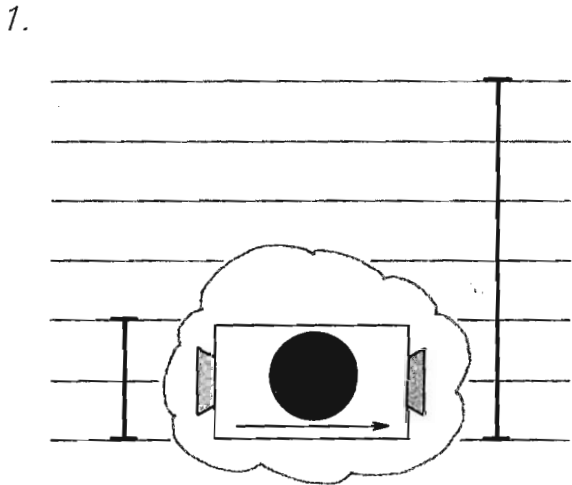
W DO ANY



By the way, how far is it from Mr. Miller's farm to Zabbranchburg? _____ miles



You do the rest. If the job CAN be done, fill in the ●
 If the job CANNOT be done, cross out the machine.



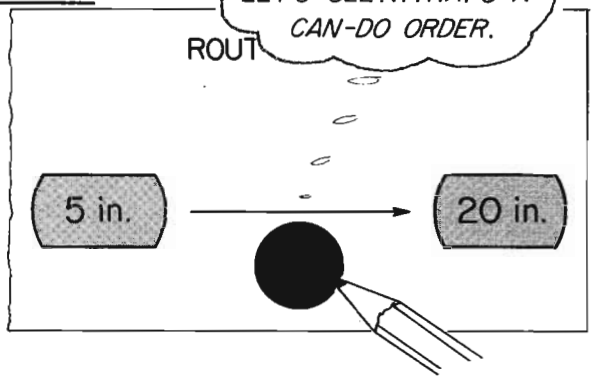
ZABRANCHBURG
STRETCH FACTORY



IF THE ORDER ON THE ROUTING SLIP IS A *CAN-DO* ORDER, FILL IN THE ●. IF IT IS A *CANNOT-DO* ORDER, CROSS OUT THE ARROW.

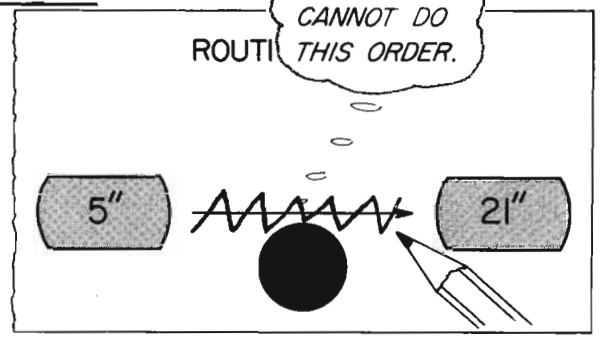
Sample 1.

LET'S SEE... THAT'S A
CAN-DO ORDER.

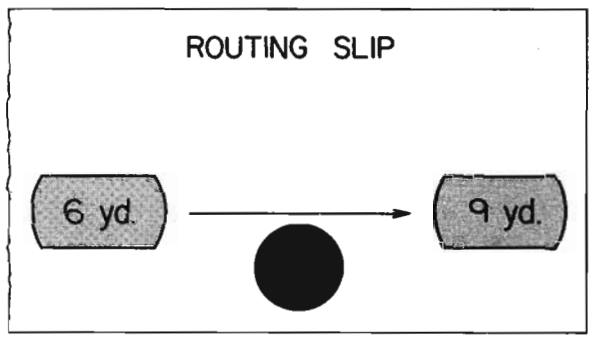


Sample 2.

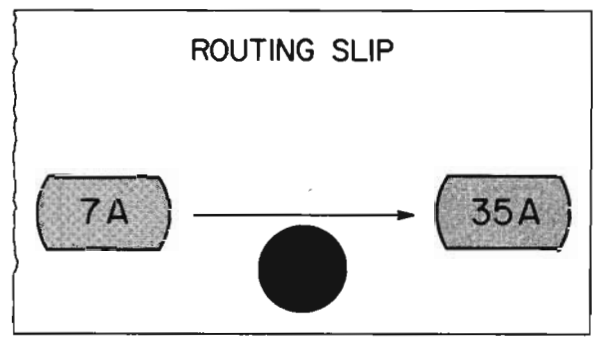
NOPE... WE
CANNOT DO
THIS ORDER.



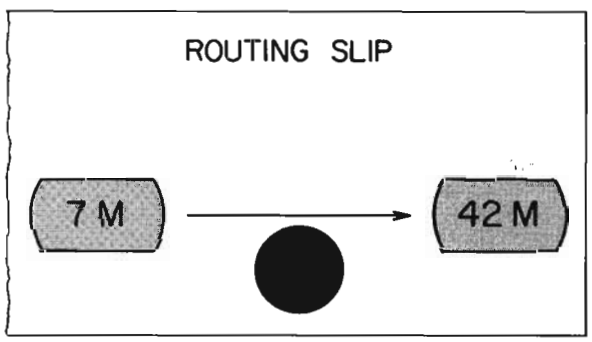
1.



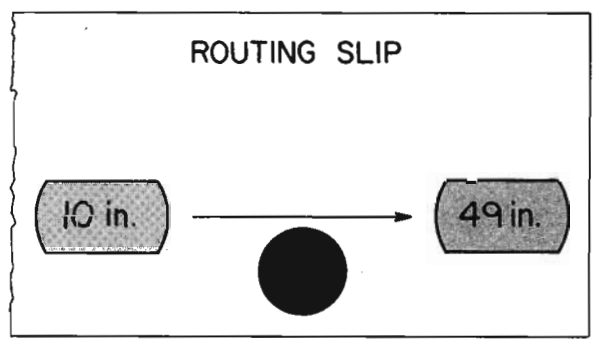
2.



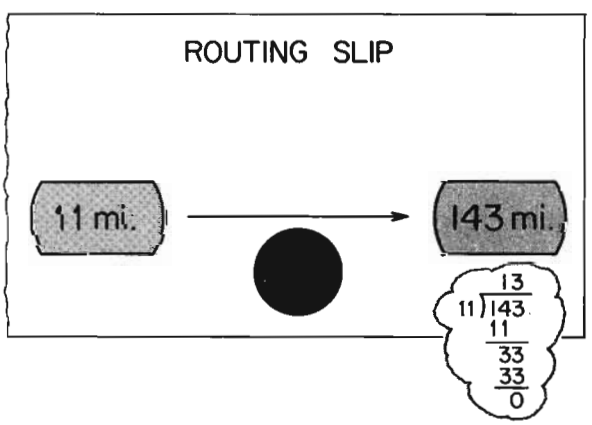
3.



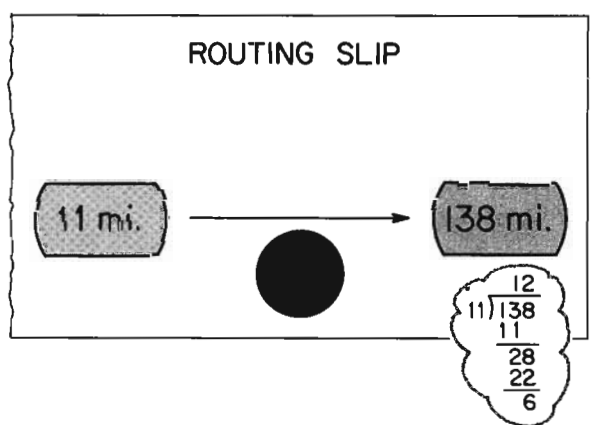
4.



5.

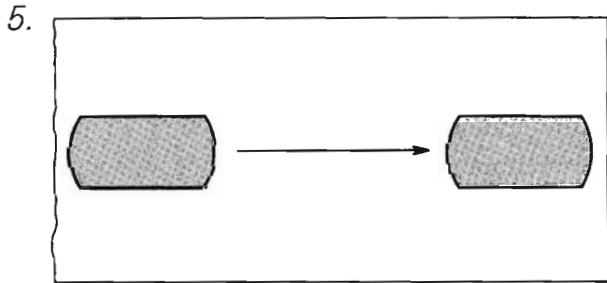
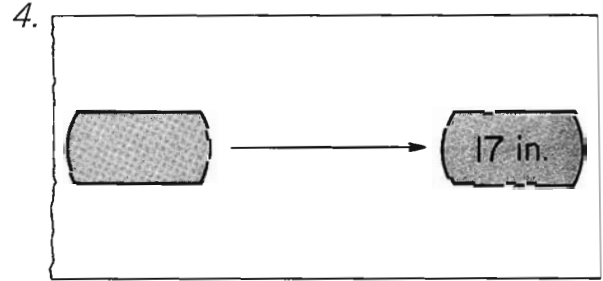
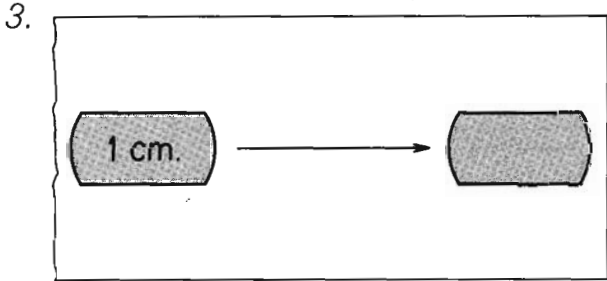
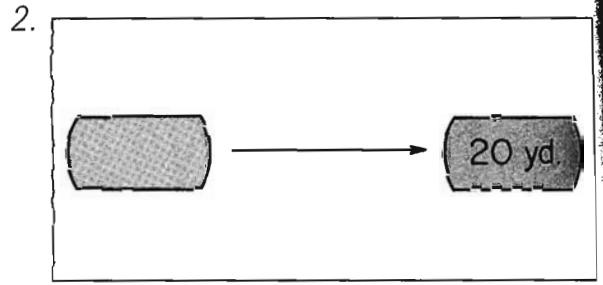
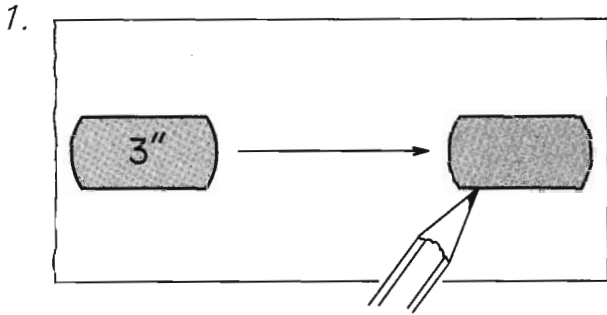


6.





PUT A CAN-DO ORDER ON EACH OF THESE ROUTING SLIPS.

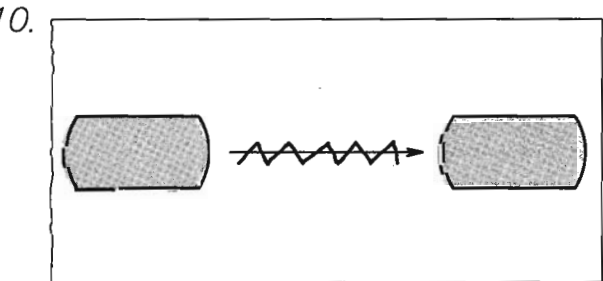
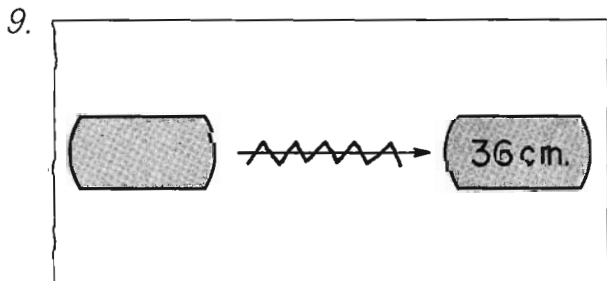
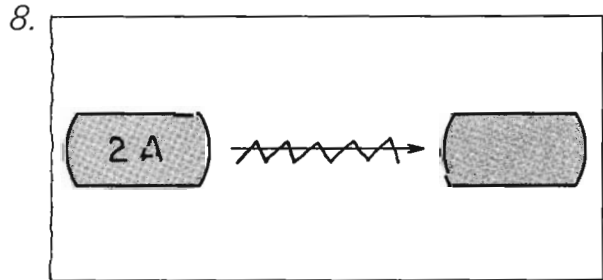
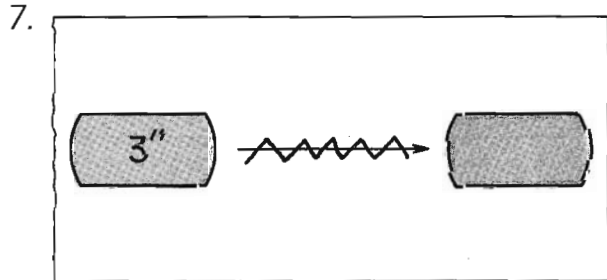


6. WHAT MACHINE WOULD YOU USE TO DO YOUR CAN-DO ORDER IN PROBLEM 5?

I'D USE A ● MACHINE.

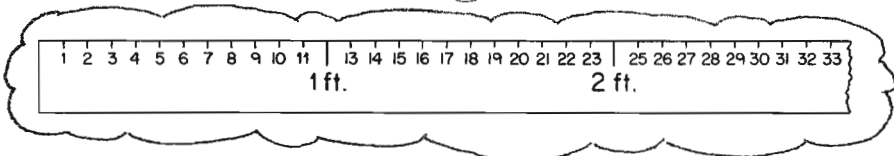


PUT A CANNOT-DO ORDER ON EACH OF THESE ROUTING SLIPS.



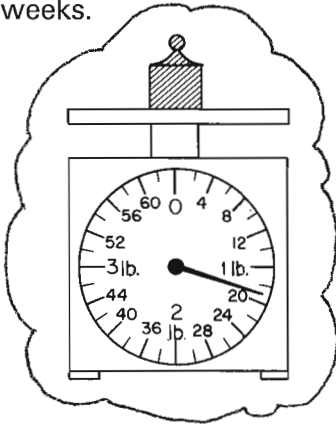
Fill the blanks.

1. 27 inches is more than _____ feet, but less than _____ feet.



2. 30 days is more than _____ weeks, but less than _____ weeks.

3. 19 oz. is more than _____ lb., but less than _____ lb.



4. In Zabbranchburg there are 10 blocks in a mile. So if you walked 28 blocks, you would have walked more than _____ miles, but less than _____ miles.

5. 38 months is more than _____ years, but less than _____ years.

6. 10 feet is between _____ yards and _____ yards.

7. 18 days is between _____ weeks and _____ weeks.

8. 100 min. is between _____ hr. and _____ hr.

9. _____ feet is between 2 yards and 3 yards.

Do not use the answer you gave for problem 9.

10. _____ feet is between 2 yards and 3 yards.

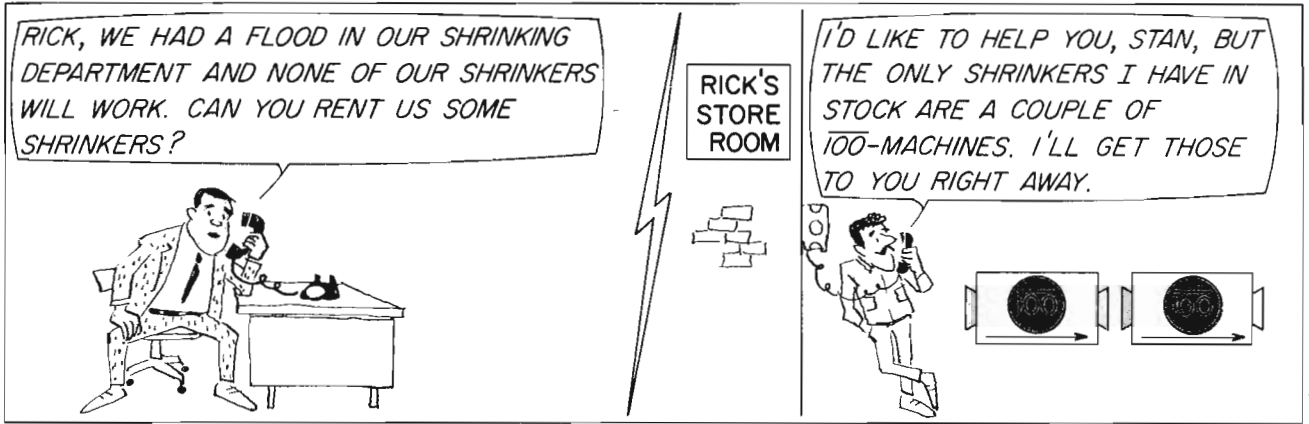
CHAPTER 1: PERCENT

Zabbranchburg S & S Factory . . .

RICK, WE HAD A FLOOD IN OUR SHRINKING DEPARTMENT AND NONE OF OUR SHRINKERS WILL WORK. CAN YOU RENT US SOME SHRINKERS?

RICK'S STORE ROOM

I'D LIKE TO HELP YOU, STAN, BUT THE ONLY SHRINKERS I HAVE IN STOCK ARE A COUPLE OF 100-MACHINES. I'LL GET THOSE TO YOU RIGHT AWAY.

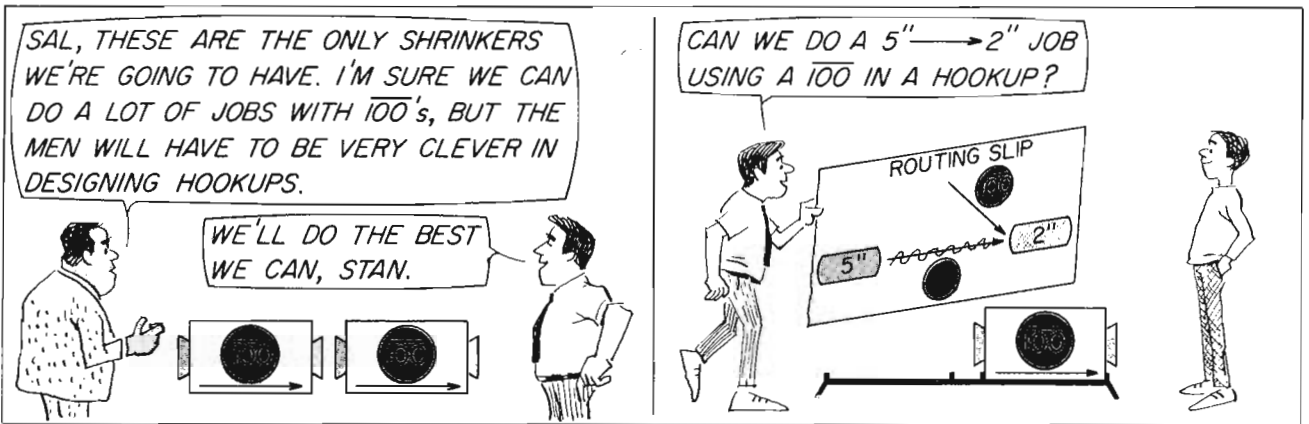


SAL, THESE ARE THE ONLY SHRINKERS WE'RE GOING TO HAVE. I'M SURE WE CAN DO A LOT OF JOBS WITH 100's, BUT THE MEN WILL HAVE TO BE VERY CLEVER IN DESIGNING HOOKUPS.

WE'LL DO THE BEST WE CAN, STAN.

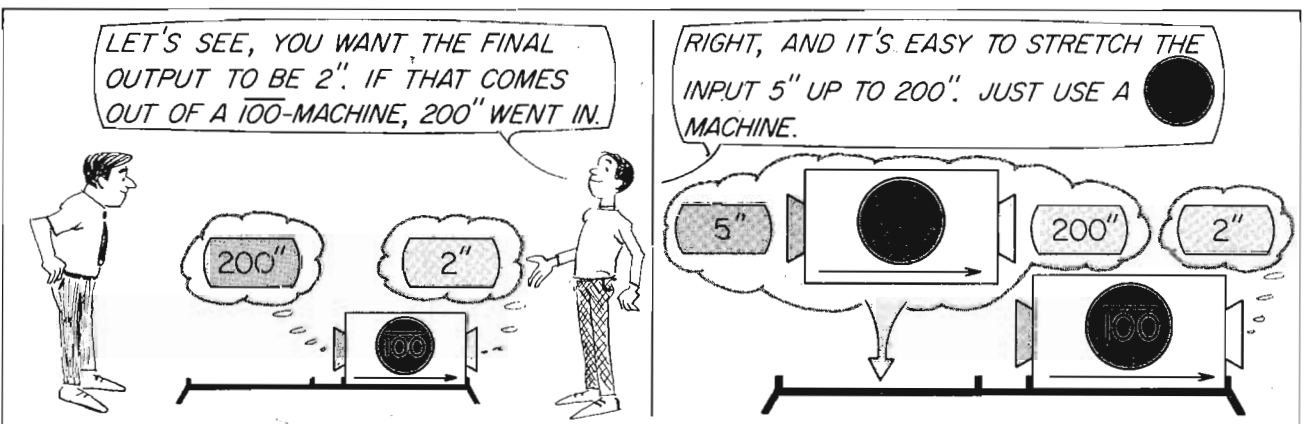
CAN WE DO A 5" → 2" JOB USING A 100 IN A HOOKUP?

ROUTING SLIP



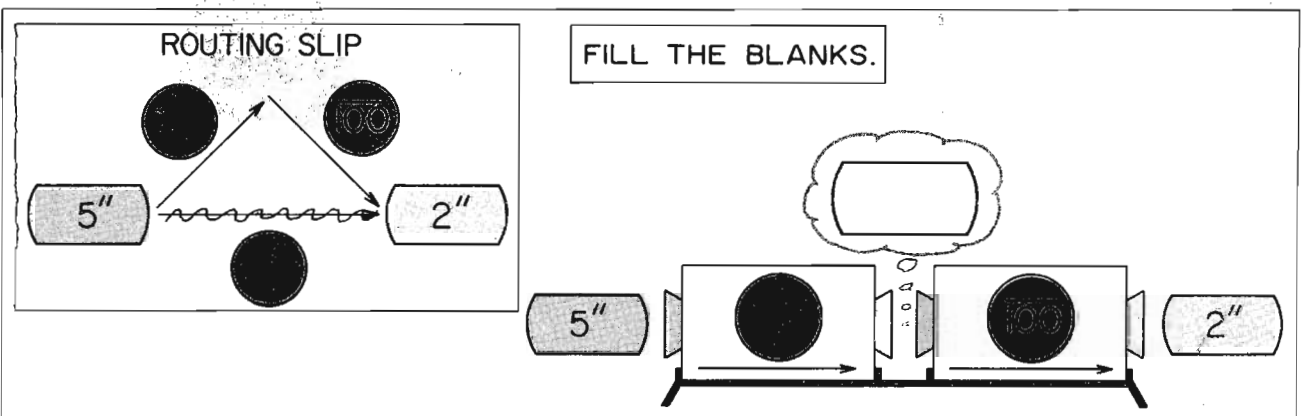
LET'S SEE, YOU WANT THE FINAL OUTPUT TO BE 2". IF THAT COMES OUT OF A 100-MACHINE, 200" WENT IN.

RIGHT, AND IT'S EASY TO STRETCH THE INPUT 5" UP TO 200". JUST USE A MACHINE.

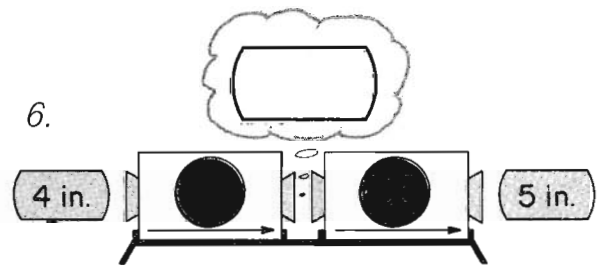
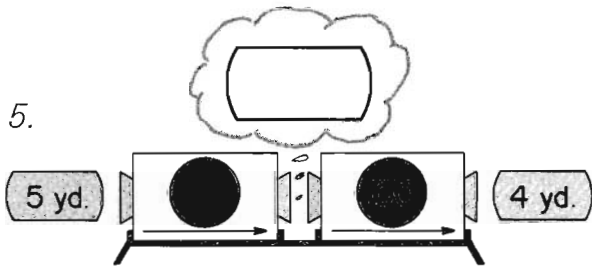
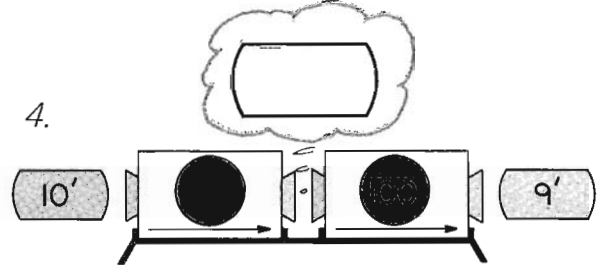
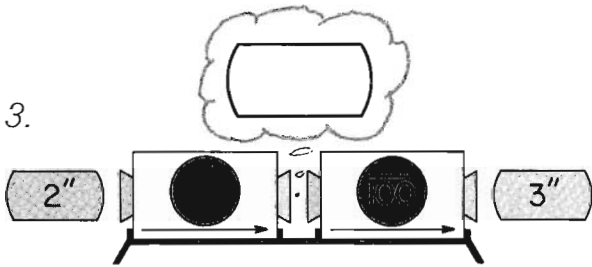
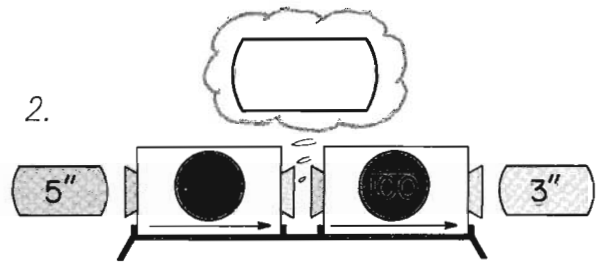
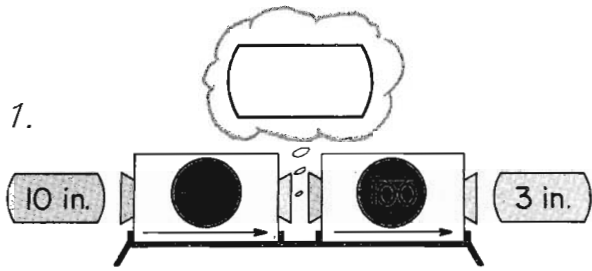


ROUTING SLIP

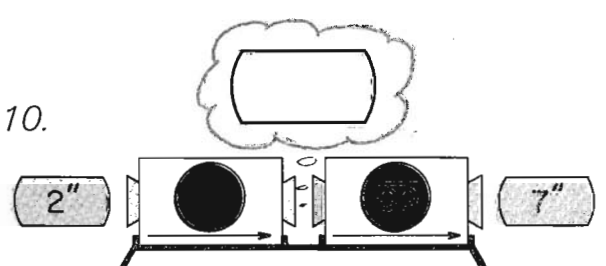
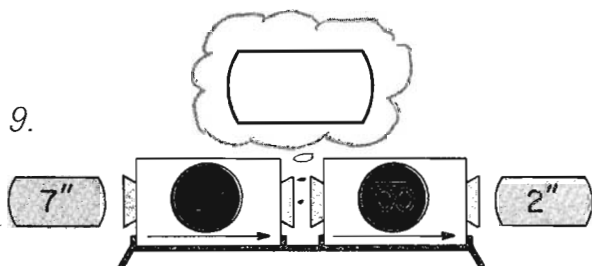
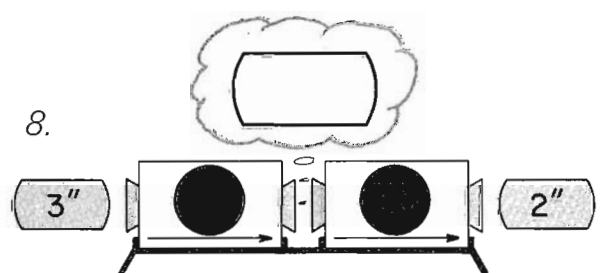
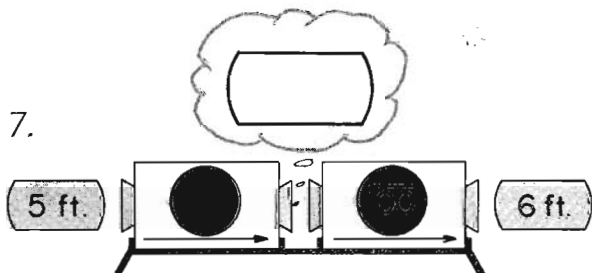
FILL THE BLANKS.



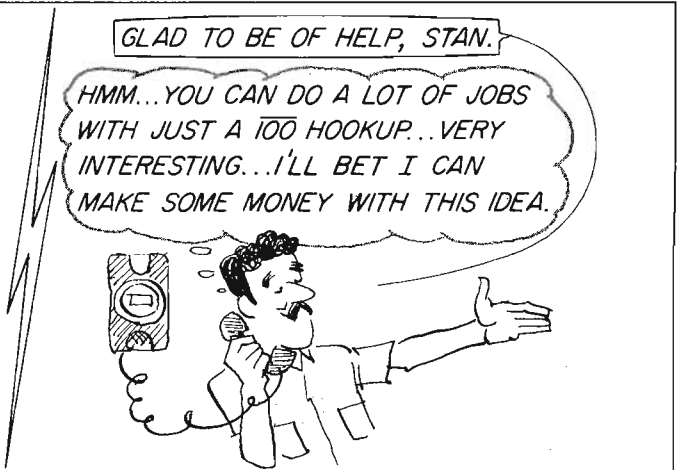
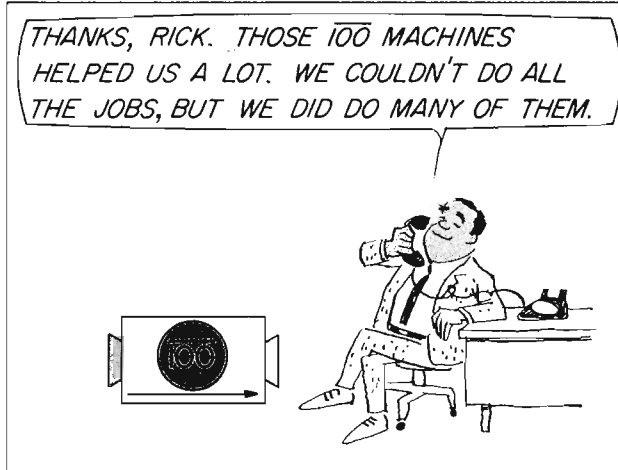
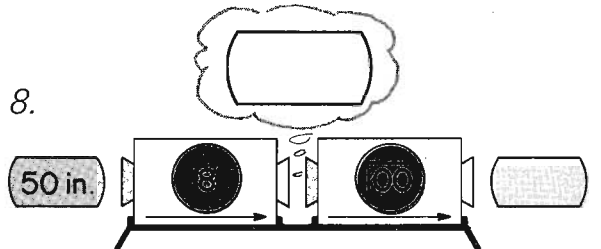
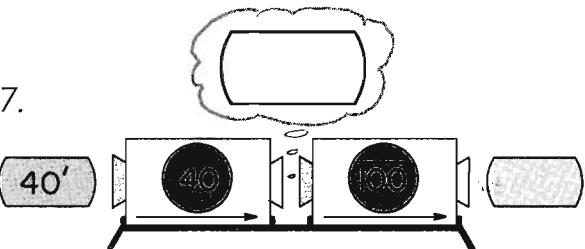
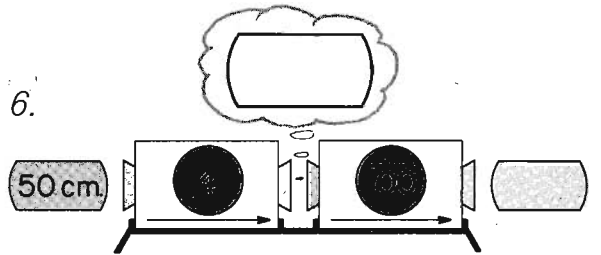
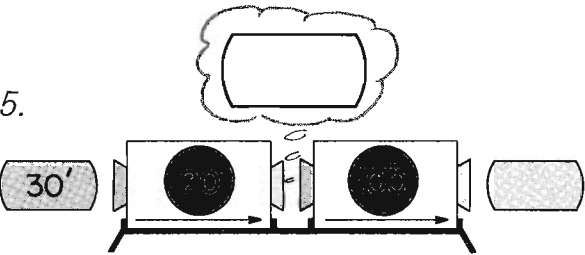
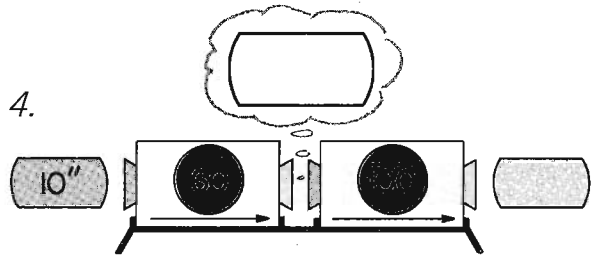
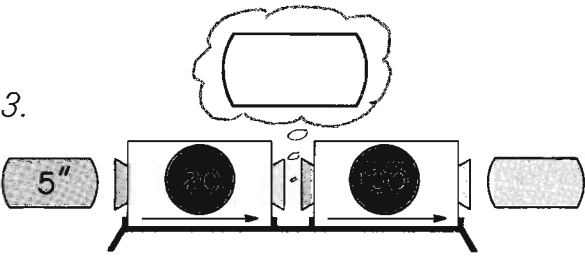
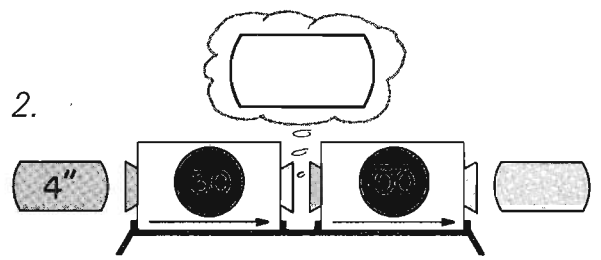
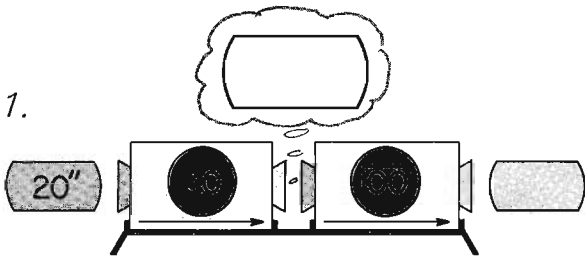
Fill the blanks.



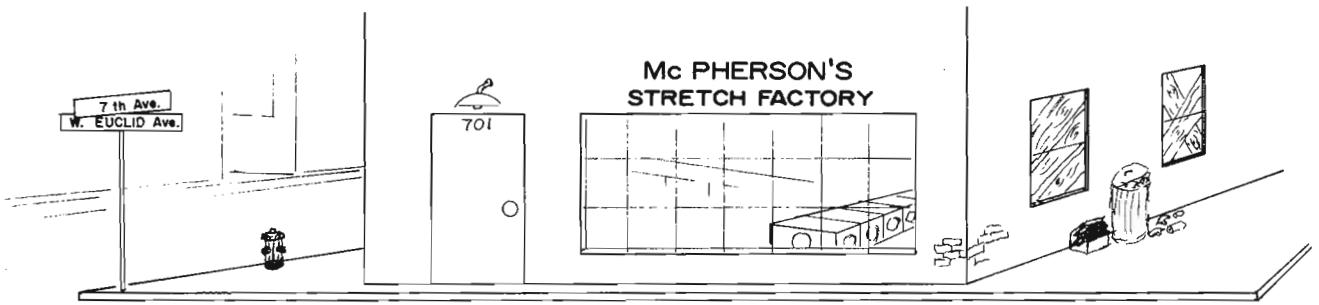
If a job can be done, fill the blanks. If it can't be done, cross it out.



Fill the blanks.



Al McPherson was the owner of an old stretch factory on the outskirts of Zabbranchburg . . .



Al's factory had a complete set of stretching machines, and for a while Al's business went very well.

Then one day (in Book 2) the Zabbranchburg Factory bought a complete set of shrinking machines. Now the Zabbranchburg Factory could do lots of jobs that Al couldn't do. For example, Al couldn't do a simple shrinking job like this:

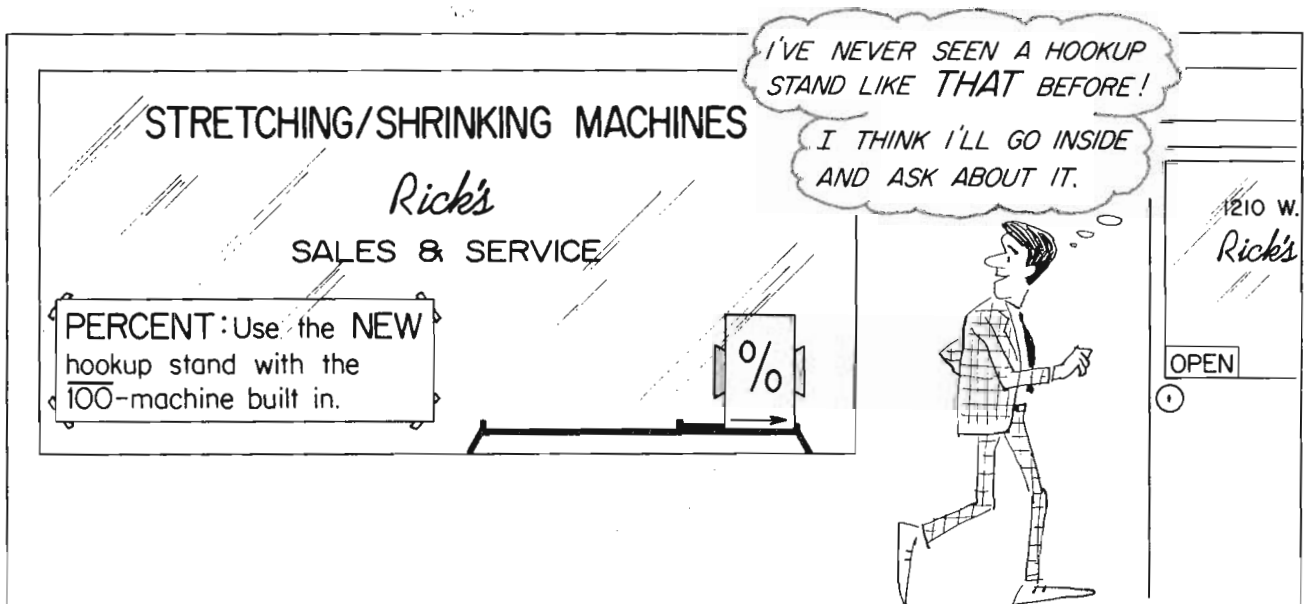


Even worse, there were lots of stretching jobs he couldn't do either—like this one:

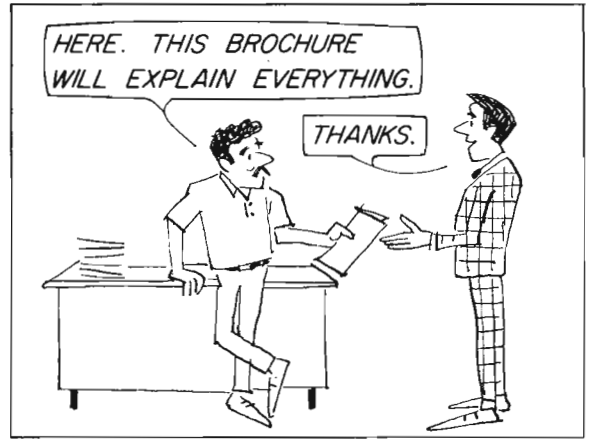


Al knew that if he wanted to stay in business, he would have to do something. But he just couldn't afford to buy a complete set of shrinking machines.

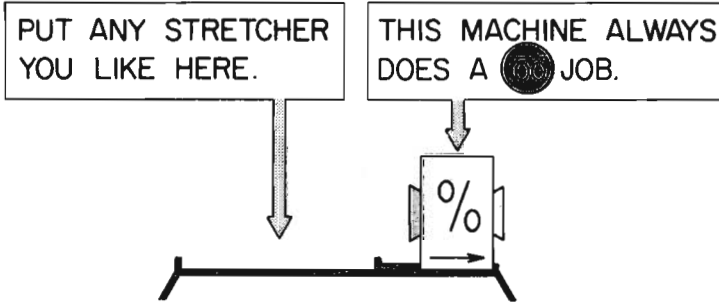
One day Al passed Rick's stretching and shrinking machines shop.



Inside Rick's shop . . .



YOU'LL BE AMAZED AT HOW MANY STRETCHING AND SHRINKING JOBS YOU'LL BE ABLE TO DO WHEN YOU USE OUR NEW, HANDY PERCENT HOOKUP STAND.



Here's an example:

Say: **FIFTEEN PERCENT.**

Think:

Write: **15 %**

And here's what the 15% hookup does to a 100-in. input.

100 in. 15 15 in.

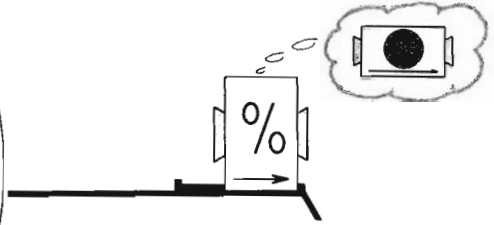
1500 in.

→

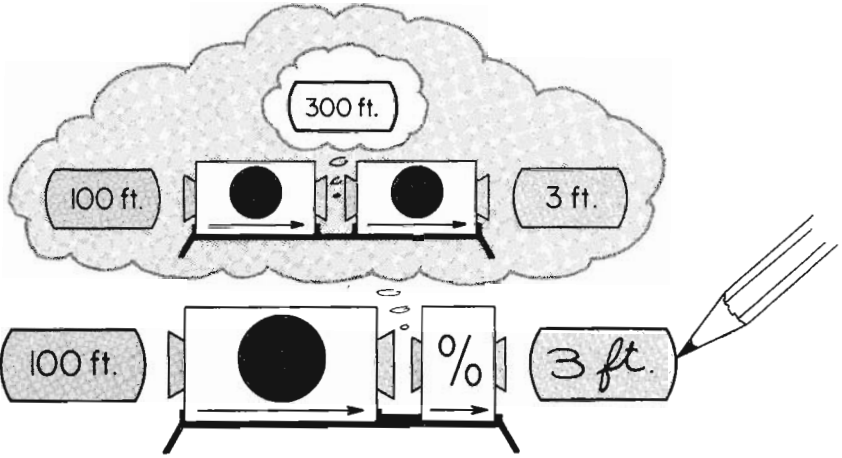
A few days later . . .



I BOUGHT A % HOOKUP STAND AND IT ARRIVED TODAY. WE STARTED USING IT RIGHT AWAY. PLEASE HELP US FILL IN THE OUTPUT TAGS.

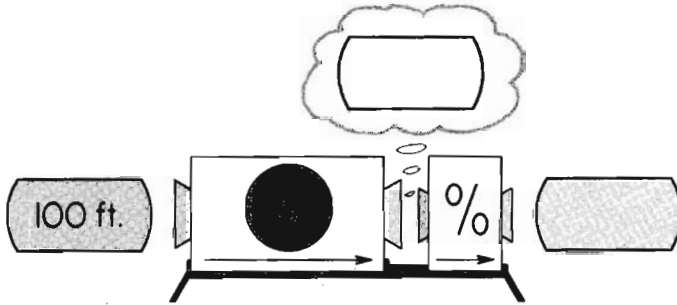


Sample:

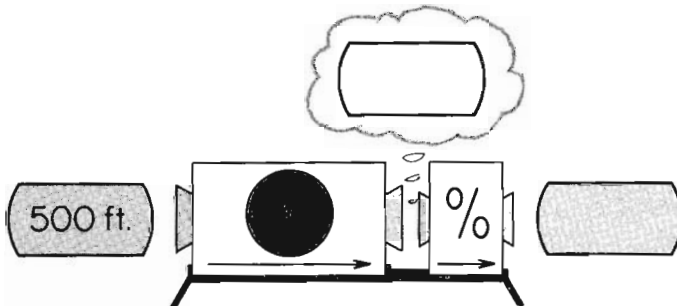


REMEMBER THIS PERCENT SIGN. % IT TELLS YOU THAT THERE'S A 100 MACHINE BUILT INTO THE HOOKUP.

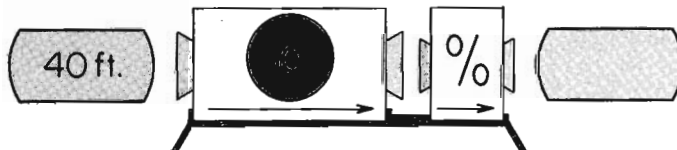
1.



2.



3.



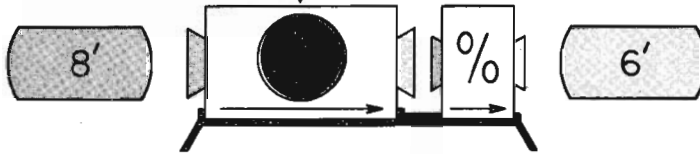
CAN WE USE A % HOOKUP TO SHRINK AN 8' STICK TO 6'?



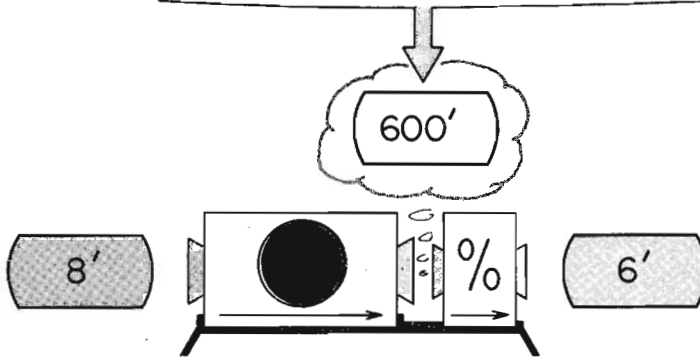
WELL, LET'S SEE...



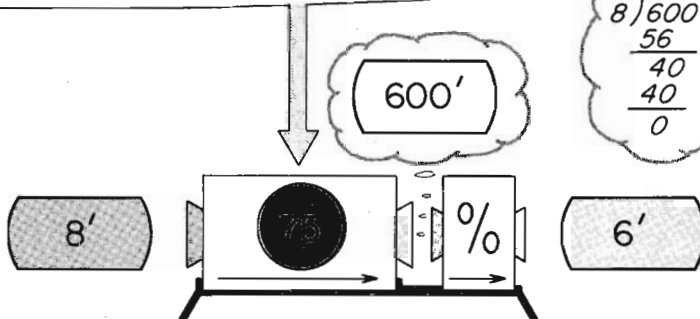
OUR PROBLEM IS: WHAT SHOULD GO HERE?



STEP 1: FIRST, LET'S FIGURE OUT WHAT THE INTERMEDIATE STICK WOULD HAVE TO BE TO GET A FINAL OUTPUT OF 6'.



STEP 2: NOW LET'S FIGURE OUT WHAT STRETCHER WE NEED TO GET FROM 8 FT. TO 600 FT.



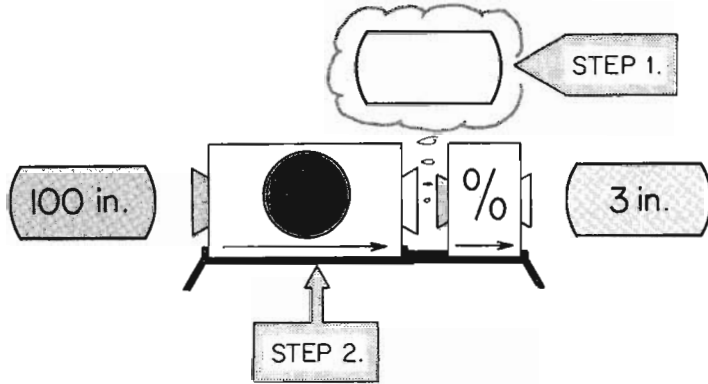
$$\begin{array}{r} 75 \\ 8 \overline{) 600} \\ \underline{56} \\ 40 \\ \underline{40} \\ 0 \end{array}$$

SO WE CAN SHRINK 8 FT. TO 6 FT. WITH A % HOOKUP!

YES.
 $8 \text{ ft.} \times 75\% = 6 \text{ ft.}$

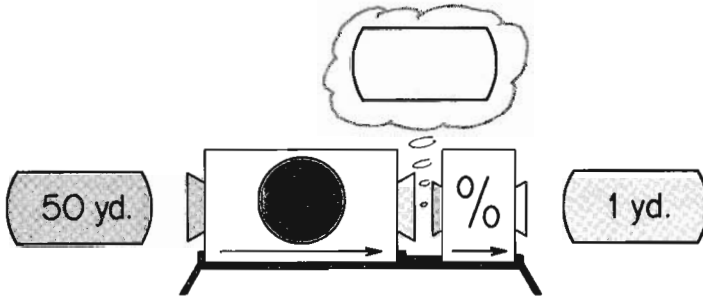
Find the % hookup you need to do each of these jobs.

1.

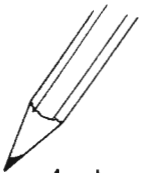


$$100 \text{ in.} \times \underline{3\%} = 3 \text{ in.}$$

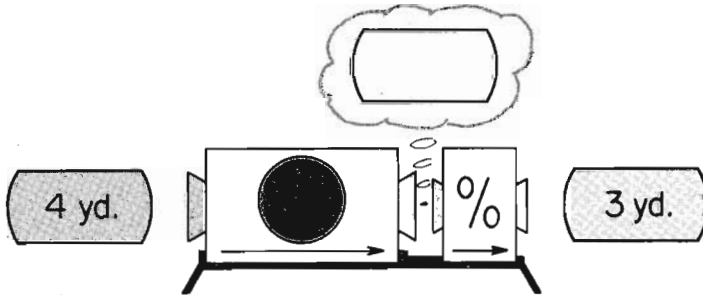
2.



$$50 \text{ yd.} \times \underline{\quad} = 1 \text{ yd.}$$

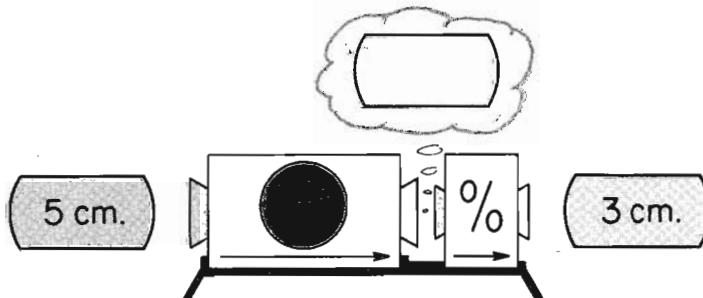


3.



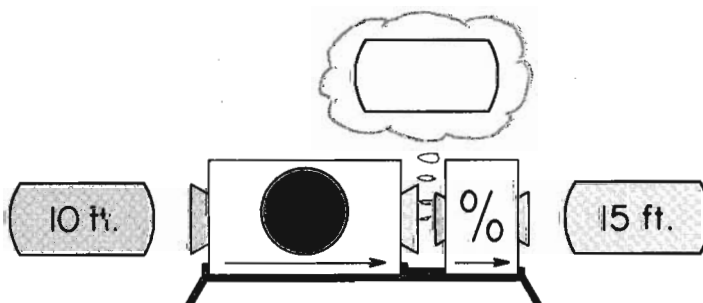
$$4 \text{ yd.} \times \underline{\quad} = 3 \text{ yd.}$$

4.



$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

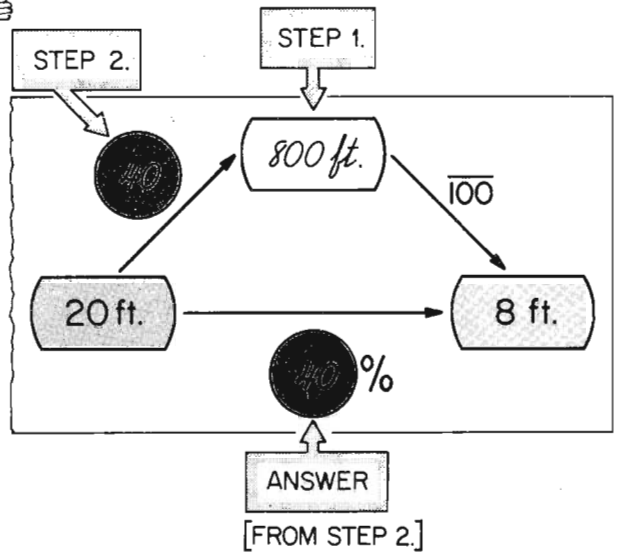
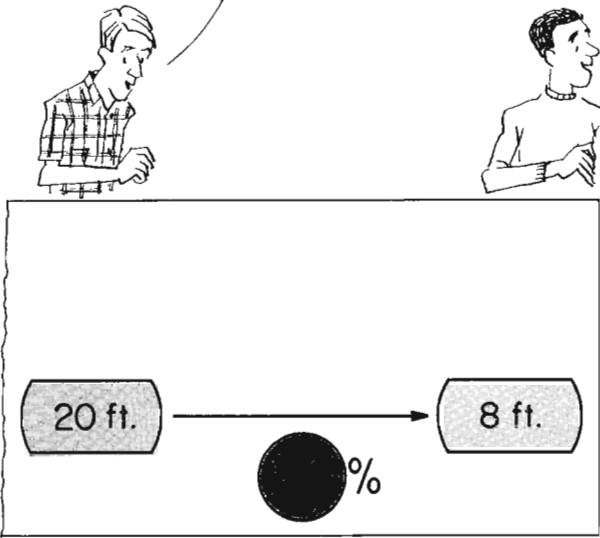
5.



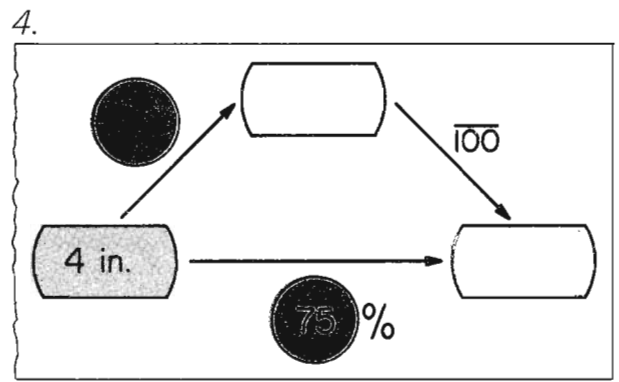
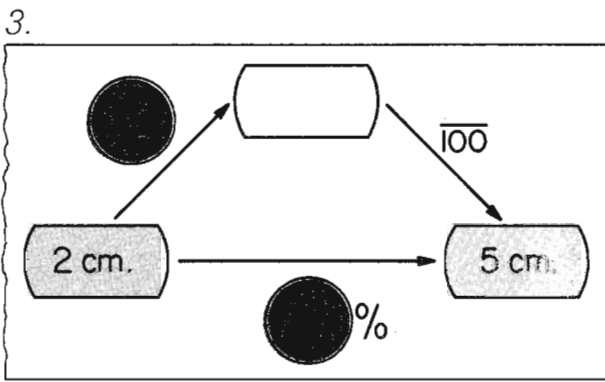
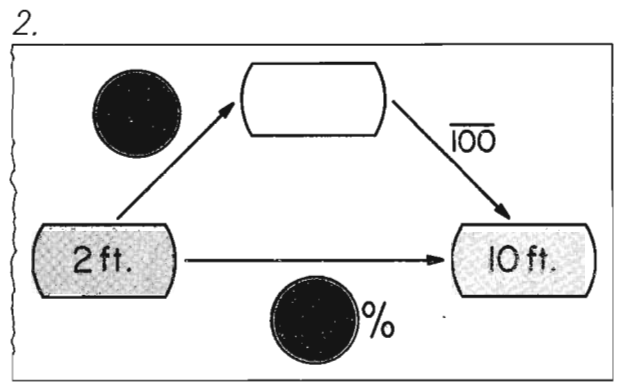
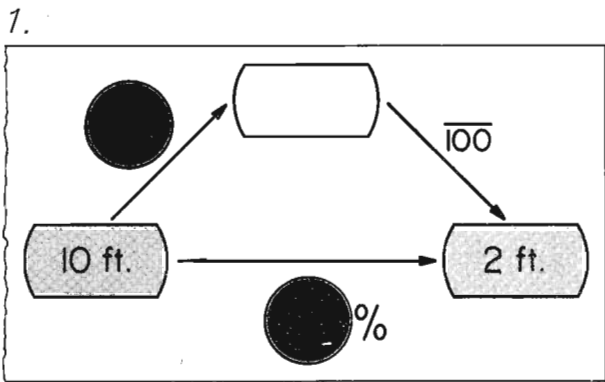
$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

WHAT % HOOKUP SHOULD I USE FOR THIS JOB?

WE CAN FIGURE THAT OUT RIGHT ON THE ROUTING SLIP, LIKE THIS:

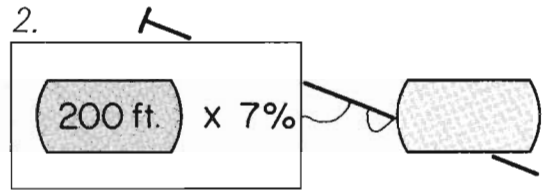
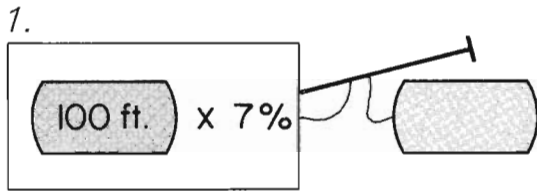


Now do these problems.



5. By the way, what short mixed hookup in lowest terms would the Zabbranchburg Factory use to do the job in problem 4? Answer: _____

These sticks went through % hookups. Please label the outputs.



3. 100 ft. x 8% = _____ ft.

4. 40 ft. x 10% = _____ ft.

5. 40 ft. x 100% = _____ ft.

6. 4 yd. x 200% = _____ yd.

7.

I NEED TO KNOW WHAT 10% OF 30 FT. IS.

WELL, LET'S BUILD A 10% HOOKUP AND FIND OUT.

30 ft.

%

3 ft.

HERE'S THE OUTPUT. SO 10% OF 30 FT. IS _____.

8.

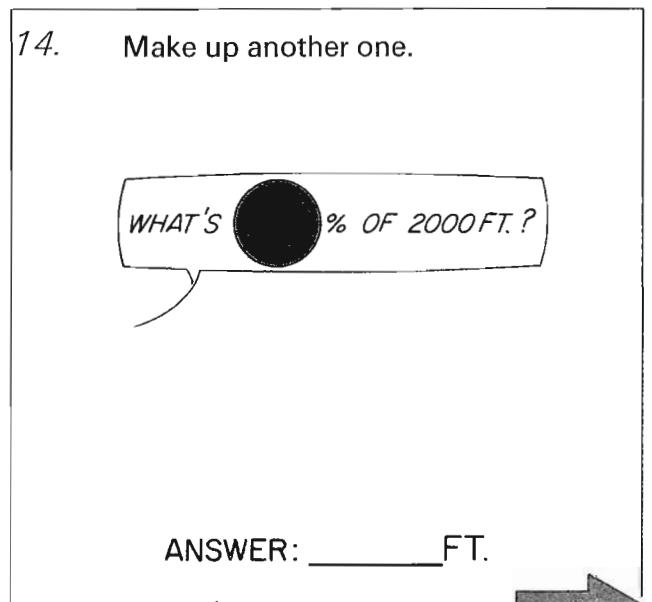
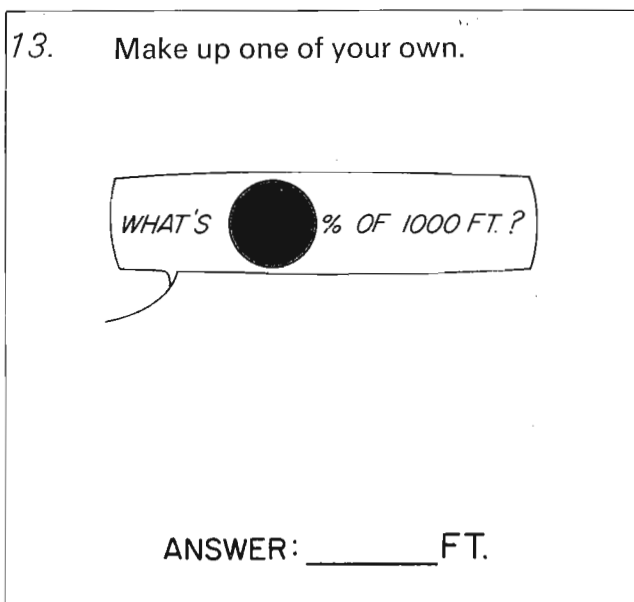
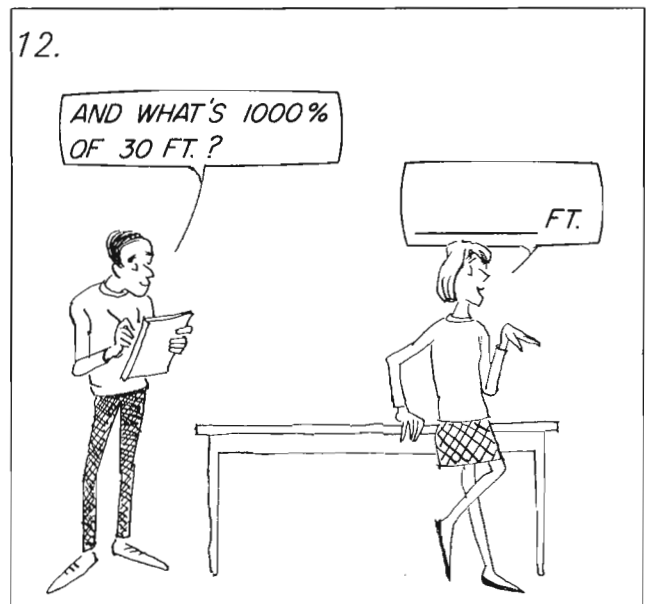
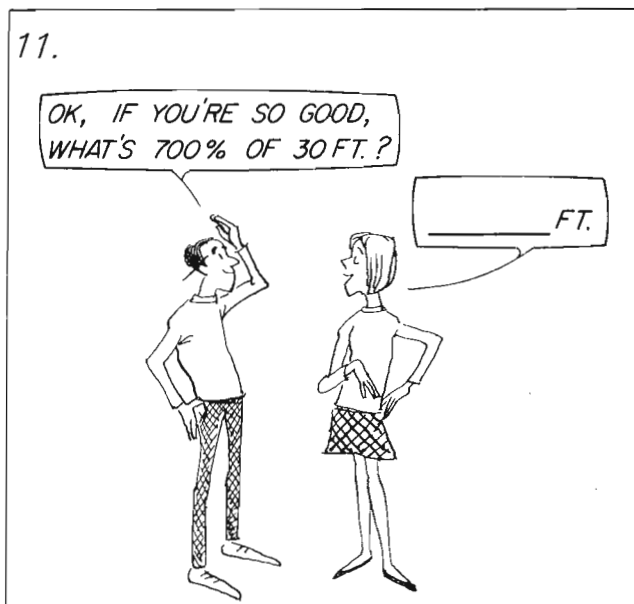
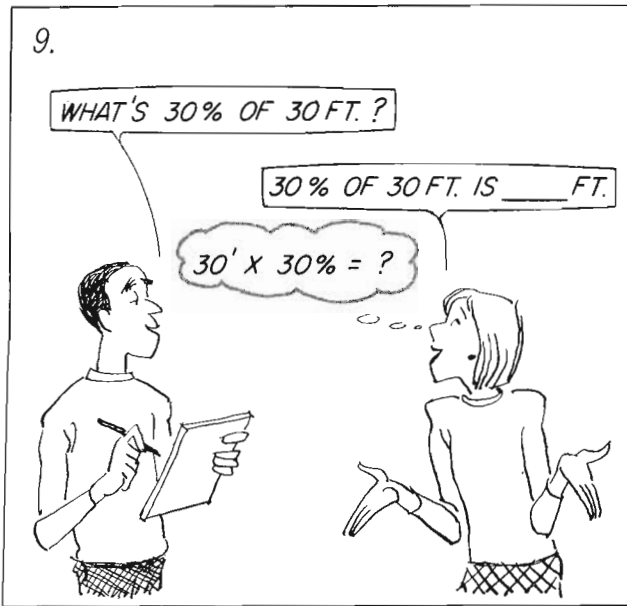
WHAT DO YOU SUPPOSE 20% OF 30 FT. IS?

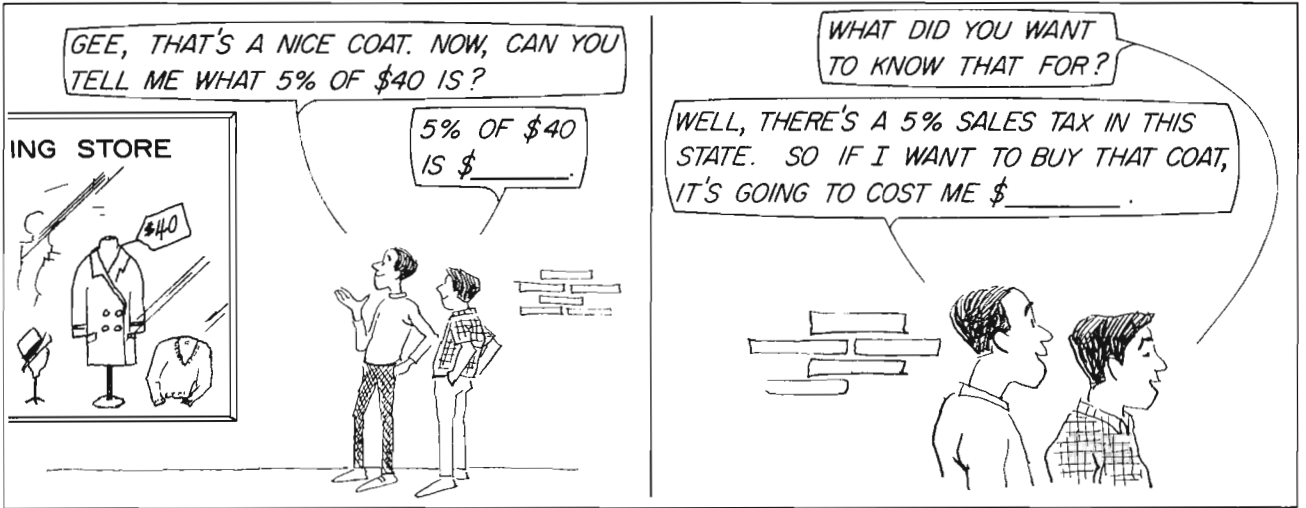
30 ft.

%

3 ft.

20% OF 30 FT. IS _____ FT.





16.

Zabbranchburg Dept. Store
February 15, 1969

ITEM	PRICE
Raincoat	\$ 30
Umbrella	10
Sweater	20
Total	\$
5% sales tax	
Pay This Amt.	<input type="text"/>

17.

Anabru Emporium
February 15, 1969

ITEM	PRICE
Raincoat	\$ 25
Umbrella	7
Sweater	18
Total	\$
6% sales tax	
Pay This Amt.	<input type="text"/>

☆18.

ZABRANCHBURG BANK & TRUST CO.

WE PAY 5% INTEREST PER YEAR ON YOUR SAVINGS.

I'VE HAD \$800 IN THAT BANK FOR A YEAR NOW. HOW MUCH INTEREST DID I EARN?

ANSWER: _____

One year later ...

I DIDN'T TOUCH MY SAVINGS. I DIDN'T EVEN TAKE OUT THE INTEREST. HOW MUCH INTEREST DID I EARN THIS YEAR?

ANSWER: _____

One day the Zabbranchburg Department Store decided to have a

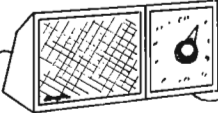
BIG SALE!

Fill each sale tag.

Sample:

10% OFF!

\$20
REGULAR



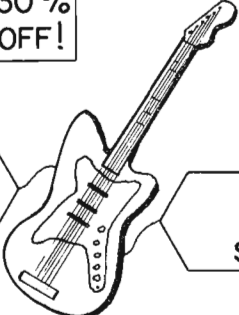
\$18
SALE

REGULAR PRICE: \$20
SUBTRACT 10%: -\$ 2
SALE PRICE: \$18

1.

30% OFF!

\$30
REGULAR



SALE

REGULAR PRICE: \$ _____
SUBTRACT 30%: -\$ _____
SALE PRICE: \$ _____

2.

20% OFF!

\$10
REGULAR



SALE

\$ _____
-\$ _____
\$ _____

3.

25% OFF!

\$8
REGULAR

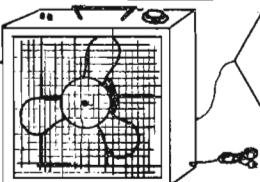


SALE

4.

20% OFF!

\$20
REGULAR



SALE

Ron's

APPLIANCE SHOP



Fill each blank.

$\$100 \times 20\%$

1. BOY, I'D SURE LIKE TO HAVE THAT BLACK AND WHITE TV. I'LL NEED \$_____ FOR A DOWN PAYMENT.

2. THE DOWN PAYMENT ON THE COLOR TV IS \$_____.

3. THE DOWN PAYMENT ON THE WASHER AND DRYER TOGETHER IS \$_____.

4. I'VE GOT \$31.75. IS THAT ENOUGH FOR A DOWN PAYMENT ON THE DRYER? _____
YES/NO

5. I'VE GOT \$1.50.

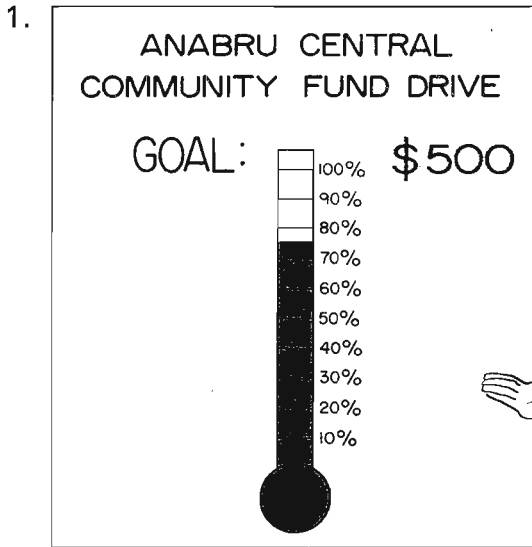
SO DO I.

DO WE HAVE ENOUGH FOR A DOWN PAYMENT ON THE RADIO? _____

YES/NO

★6. WHAT DOES THE PORTABLE STEREO COST?

I CAN'T SEE THE PRICE TAG, BUT RON SAID THE DOWN PAYMENT FOR IT IS \$16. SO IT MUST COST \$_____.

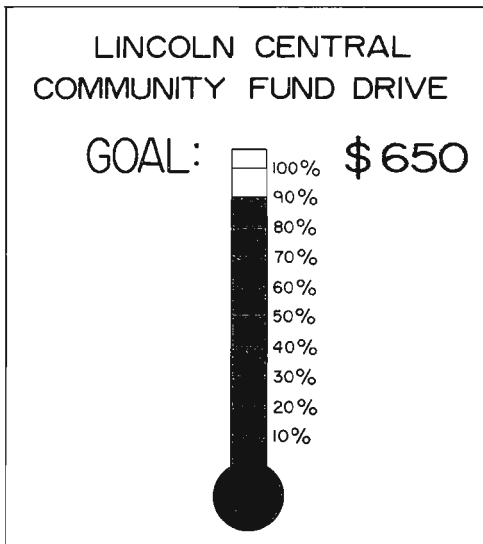



WE'VE COLLECTED  % OF OUR GOAL IN THE COMMUNITY FUND DRIVE.

I SEE. THAT MEANS WE'VE COLLECTED \$ _____.



2. Meanwhile at Lincoln Central ...



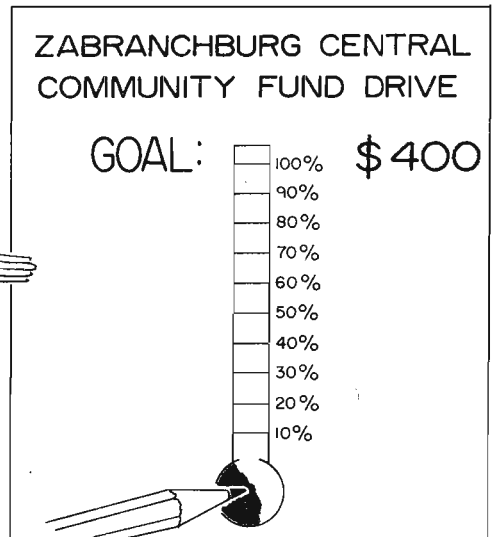
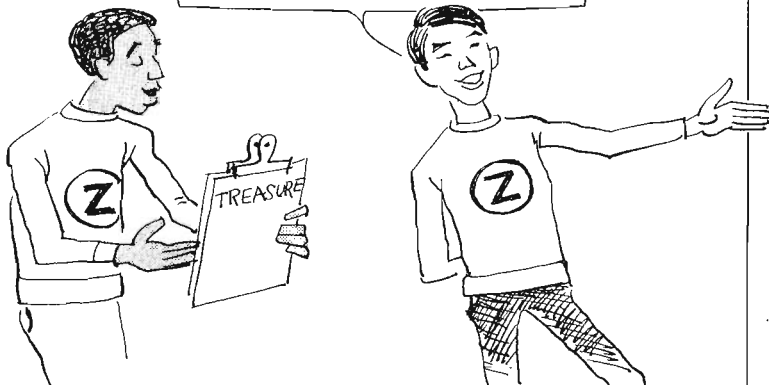
GEE, WE'RE JUST  % SHORT OF OUR GOAL; SO ALL WE HAVE TO COLLECT IS \$ _____ MORE!



3. ... And at Zabbranchburg Central ...

SO FAR WE'VE COLLECTED \$320.

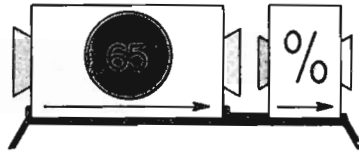
SHOW ON THIS POSTER HOW WE'RE DOING WITH OUR DRIVE.



Fill each blank.

1.

WILL THE OUTPUT STICK BE LONGER OR SHORTER THAN THE INPUT?

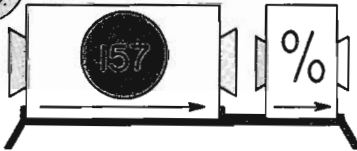


LET'S SEE... THE OUTPUT WILL BE _____ THAN THE INPUT.
SHORTER/LONGER



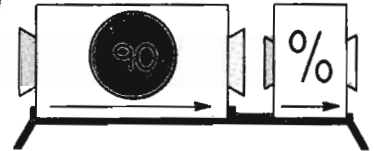
2.

THE OUTPUT WILL BE _____ THAN THE INPUT.
SHORTER/LONGER



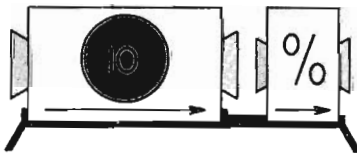
3.

THE OUTPUT WILL BE BE _____ THAN THE INPUT.
SHORTER/LONGER



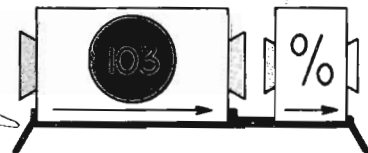
4.

THE OUTPUT WILL BE _____ THAN THE INPUT.
SHORTER/LONGER

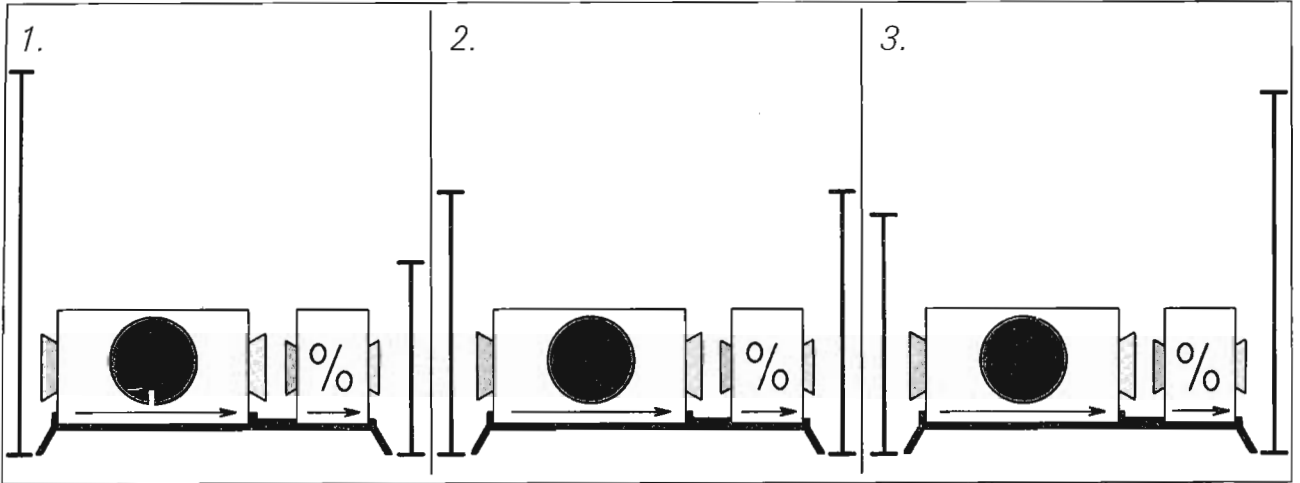



5.

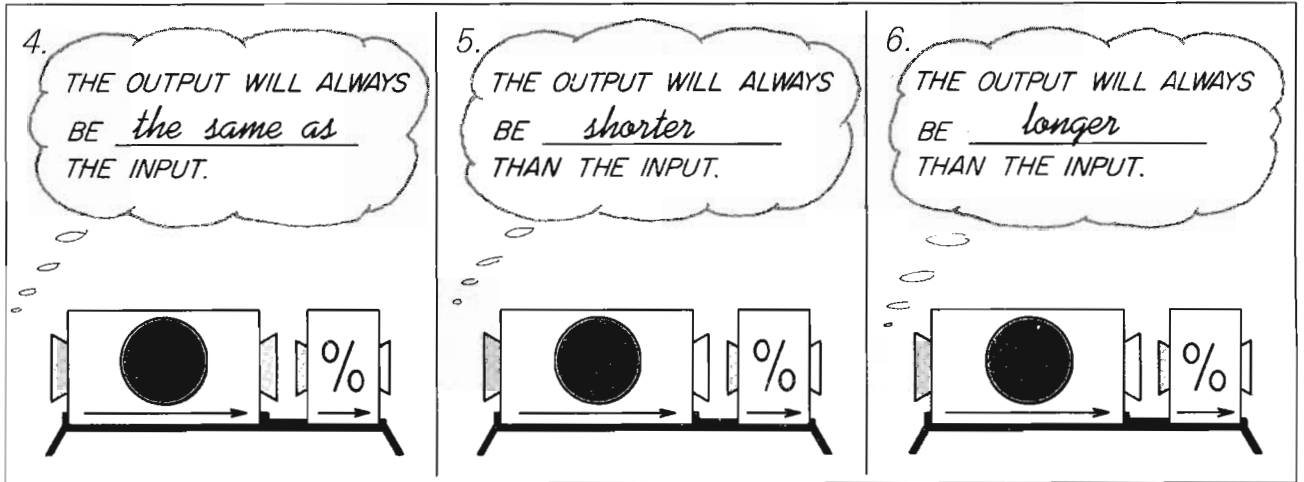
THE OUTPUT WILL BE _____ THAN THE INPUT.
SHORTER/LONGER



Put these labels on the right machines.



Fill each  so that the pictures are correct.



Some things to remember:

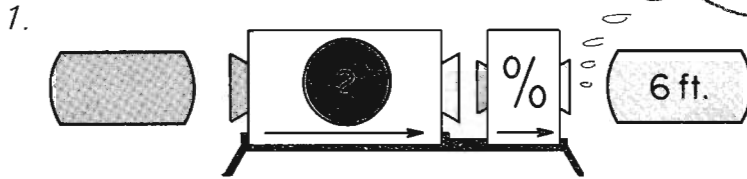
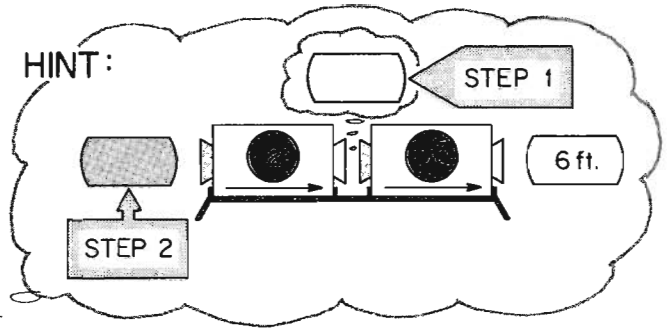
A 100% hookup does a NO-CHANGE job.

If you use a stretcher SMALLER than 100 in a percent hookup, then the hookup does a SHRINKING job.
[For example, 97% does a shrinking job.]

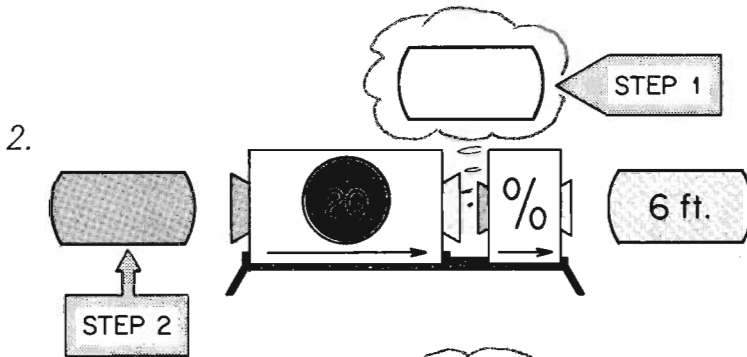
If you use a stretcher LARGER than 100 in a percent hookup, then the hookup does a STRETCHING job.
[For example, 215% does a stretching job.]


Fill each  and .

HINT:

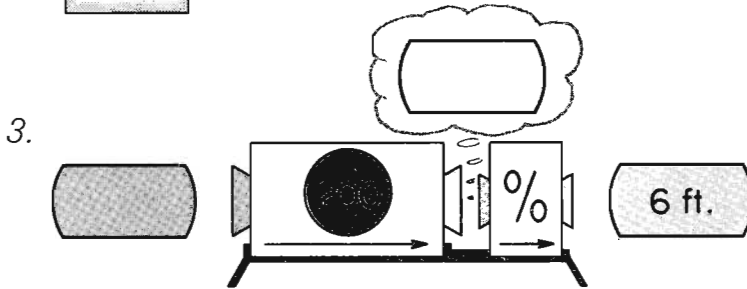


$$\underline{\hspace{2cm}} \times 2\% = 6 \text{ ft.}$$

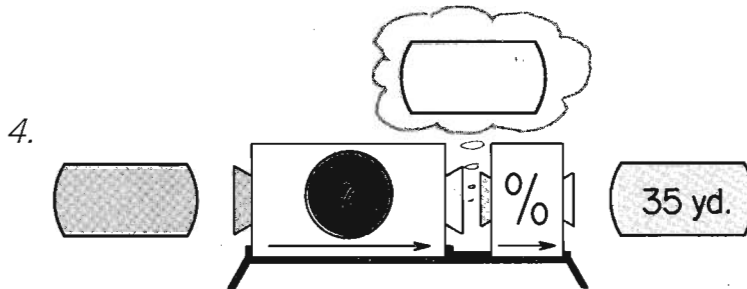




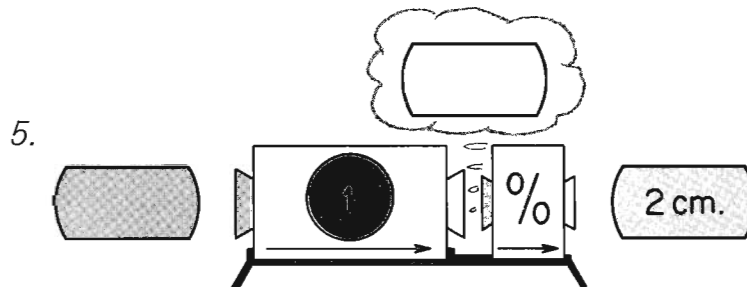
$$\underline{\hspace{2cm}} \times 20\% = 6 \text{ ft.}$$



$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = 6 \text{ ft.}$$

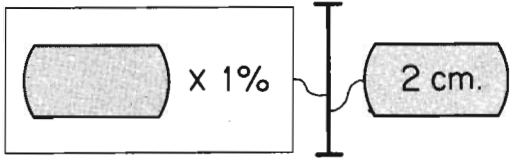


$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = 35 \text{ yd.}$$

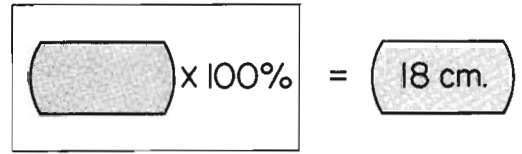


$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = 2 \text{ cm.}$$

6.



7.



8. _____ ¢ x 4% = 4 ¢

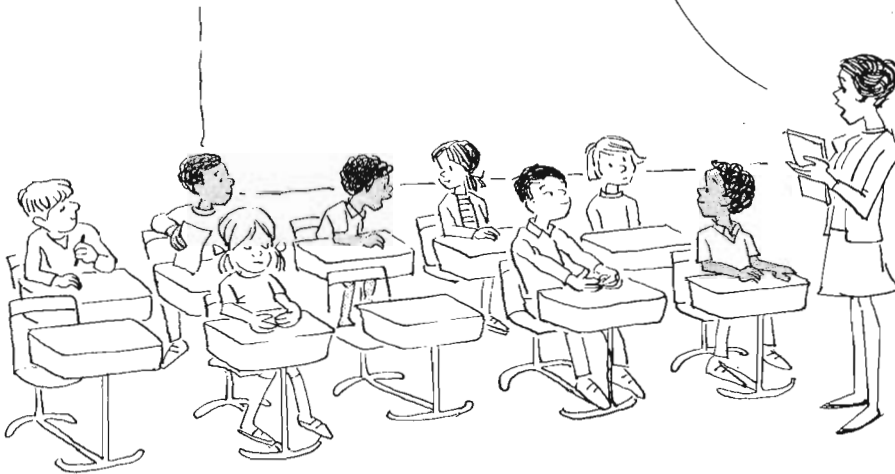
9. _____ ft. x 12% = 36 ft.

10. 10% of \$ _____ is \$1.

11. 200% of \$ _____ is \$24.

☆12.

WHERE'S EVERYBODY TODAY? ONLY 40% OF THE CLASS IS HERE.

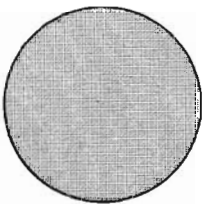


How many students are enrolled in the class?

How many are absent?

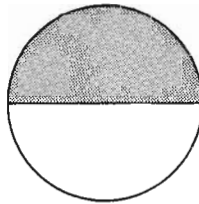
What per cent of each disc is shaded? Loop the correct answer.

☆13.



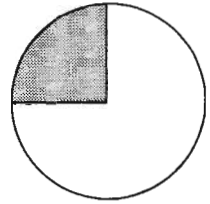
1% 10% 100%

☆14.



5% 50% 100%

☆15.



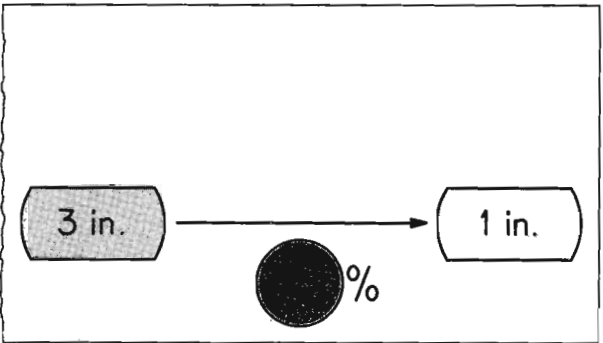
25% 40% 90%

PERCENT HOOKUPS ARE GREAT. BUT YOU KNOW THERE ARE JOBS YOU CAN'T DO WITH A PERCENT HOOKUP.

REALLY? GIVE ME AN EXAMPLE OF A JOB LIKE THAT.

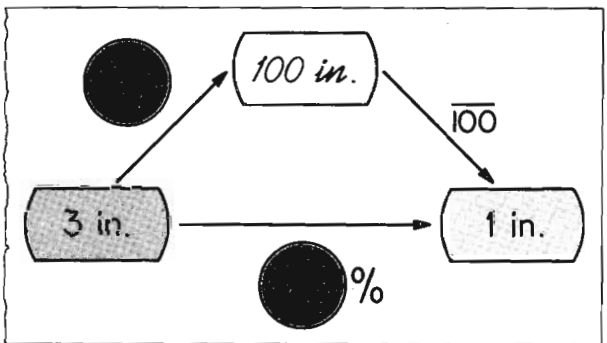


OK. LET'S TAKE A LOOK AT THIS JOB.



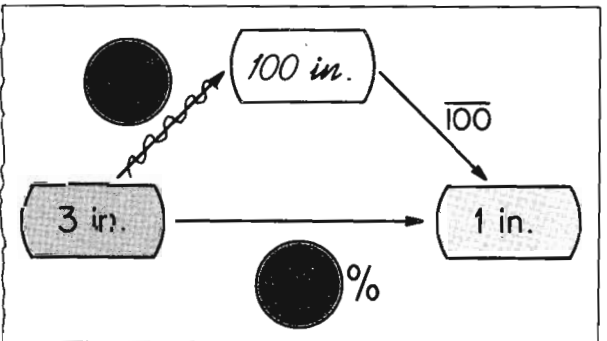
Step 1

TO GET A 1" FINAL OUTPUT, THE INTERMEDIATE STICK WOULD HAVE TO BE 100" LONG.



Step 2

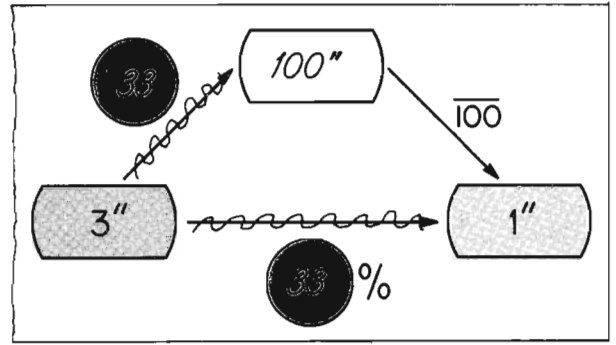
BUT THERE'S NO STRETCHER THAT WILL STRETCH 3" TO 100". SO THIS IS A CANNOT-DO ORDER.



$$\begin{array}{r} 33 \\ 3 \overline{)100} \\ \underline{9} \\ 10 \\ \underline{9} \\ 1 \end{array}$$

THE REMAINDER IS NOT 0.

OF COURSE, IF THE CUSTOMER ISN'T TOO PARTICULAR, WE CAN USE A 33-MACHINE, WHICH IS THE BEST APPROXIMATION.




We can write this:

$$3'' \times 33\% \approx 1''$$

And we say:

3" THROUGH A 33% HOOKUP IS APPROXIMATELY EQUAL TO 1".

Fill each . If it's a CANNOT-DO order, use the best approximation and put a dot over the equal sign.

Sample 1:

$$7 \text{ in.} \times \text{ } \circ \text{ } \% = 3 \text{ in.}$$

Solution:

$$7 \text{ in.} \times 43 \% \approx 3 \text{ in.}$$

$$\begin{array}{r} 42 \\ 7 \overline{)300} \\ \underline{28} \\ 20 \\ \underline{14} \\ 6 \end{array}$$

Sample 2:

$$4 \text{ in.} \times \text{ } \circ \text{ } \% = 3 \text{ in.}$$

Solution:

$$4 \text{ in.} \times 75 \% = 3 \text{ in.}$$

$$\begin{array}{r} 75 \\ 4 \overline{)300} \\ \underline{28} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

1. $2 \text{ in.} \times \text{ } \circ \text{ } \% = 3 \text{ in.}$

2. $3 \text{ in.} \times \text{ } \circ \text{ } \% = 2 \text{ in.}$

3. $7 \text{ ft.} \times \text{ } \circ \text{ } \% = 4 \text{ ft.}$

4. $4 \text{ ft.} \times \text{ } \circ \text{ } \% = 7 \text{ ft.}$

5. $5 \text{ lb.} \times \text{ } \circ \text{ } \% = 6 \text{ lb.}$

6. $\$21 \times \text{ } \circ \text{ } \% = \42

7. $100 \text{ cm.} \times \text{ } \circ \text{ } \% = 1 \text{ cm.}$

8. $8 \text{ miles} \times \text{ } \circ \text{ } \% = 1 \text{ mile}$