

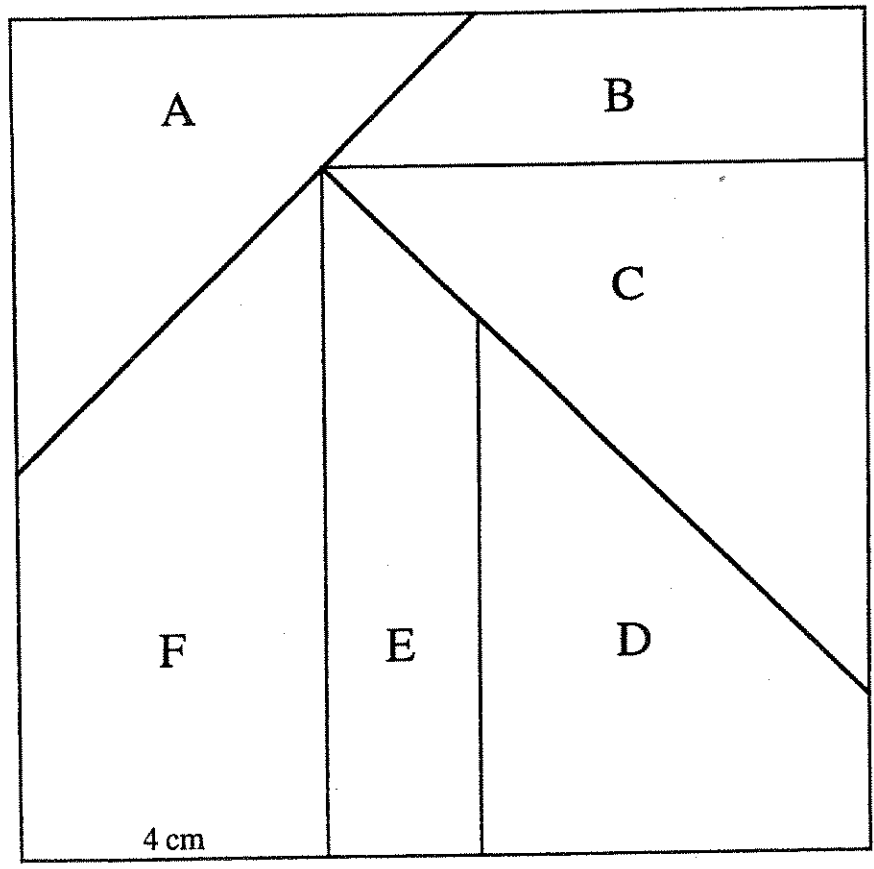
Size Changes in Planar Figures

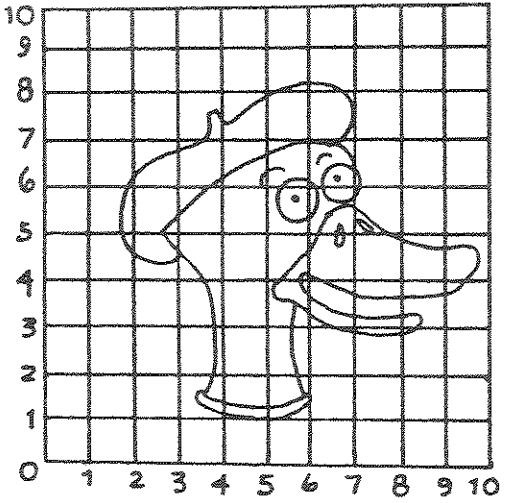
Activity: Make a Bigger Puzzle (individual/small group)

Special tools needed: Ruler with metric (protractor optional)

The pieces below may be cut out and then, as a puzzle, reassembled to make the square. You are to make a puzzle shaped just like the one below, but larger, with the following rule: The segment which measures 4 cm on the original below should measure 7 cm on the new version.

If you work as a group, each person should make at least one piece. When your group finishes, you should be able to put the new pieces together to make a square.



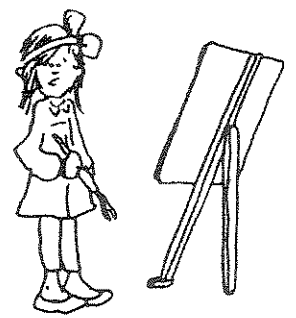


Make an enlargement of the drawing at the left on the grid below.

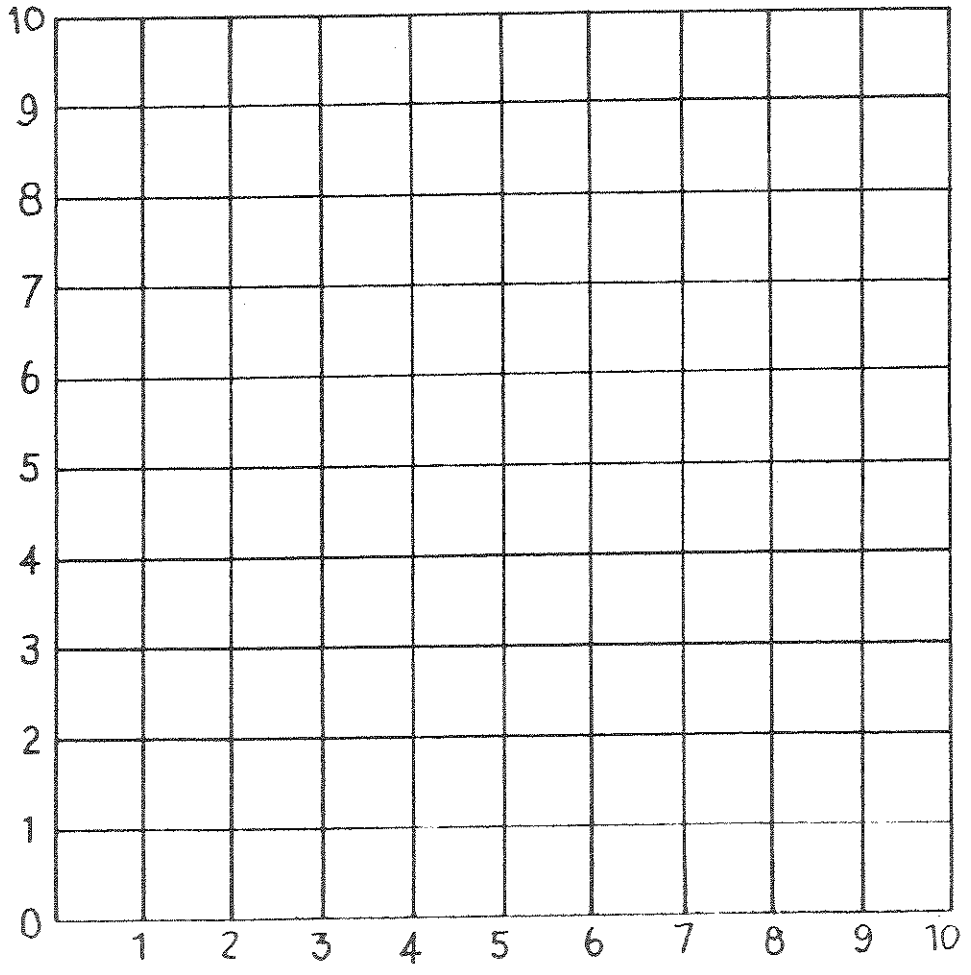
A line on the small grid should be located in a corresponding position on the large grid.



You mean mathematics helps you draw?

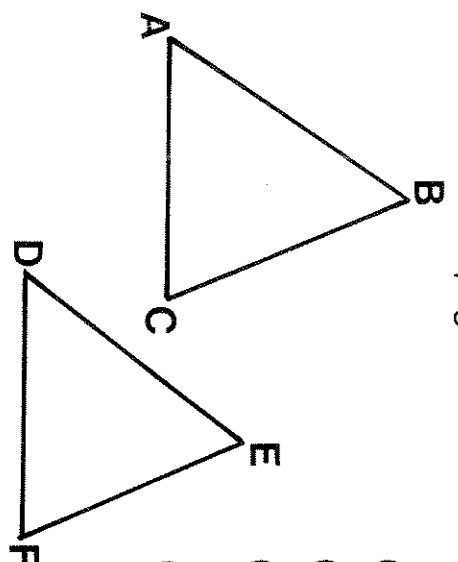


Yes, it makes it easier!

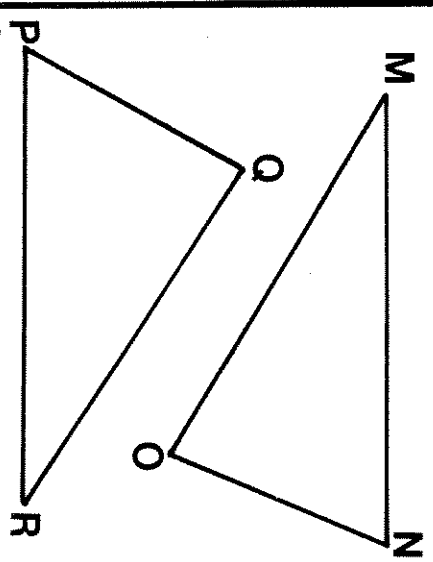


Why Did Orgo Think His Pants Were Too Short?

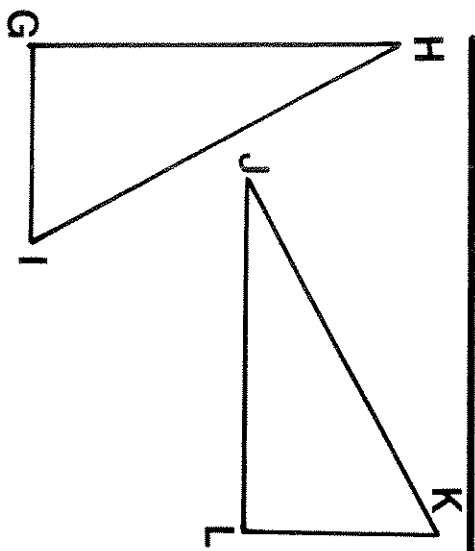
Next to each pair of congruent triangles below are listed all the angles and sides of the two triangles. Find a pair of CORRESPONDING PARTS. One of the corresponding parts will have a number, and the other will have a letter. Write the letter in the box at the bottom of the page that contains the number of the corresponding part.



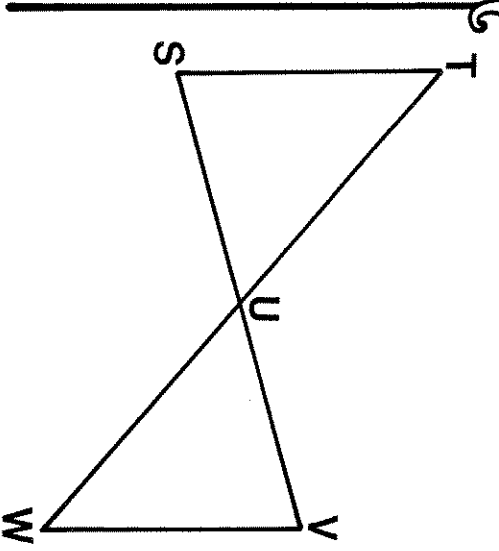
- ① $\angle A$ ⑩ \overline{EF}
- ② $\angle B$ ⑪ $\angle F$
- ③ $\angle C$ ⑫ $\angle D$
- ④ \overline{AB} ⑬ \overline{FD}
- ⑤ \overline{BC} ⑭ $\angle E$
- ⑥ \overline{CA} ⑮ \overline{DE}



- ⑬ $\angle M$ ⑲ $\angle N$
- ⑭ $\angle N$ ⑳ \overline{MN}
- ⑮ $\angle O$ ㉑ \overline{MN}
- ⑯ \overline{MN} ㉒ $\angle R$
- ⑰ \overline{NO} ㉓ \overline{QR}
- ⑱ \overline{OM} ㉔ $\angle Q$

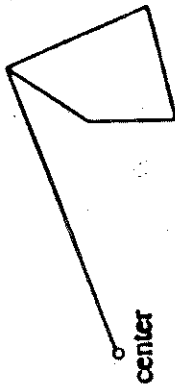


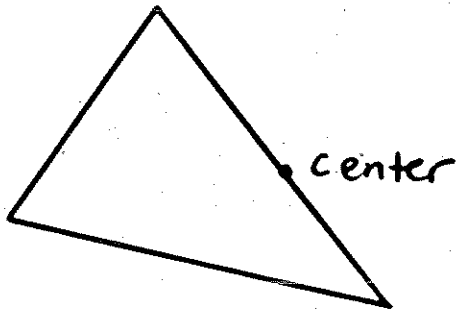
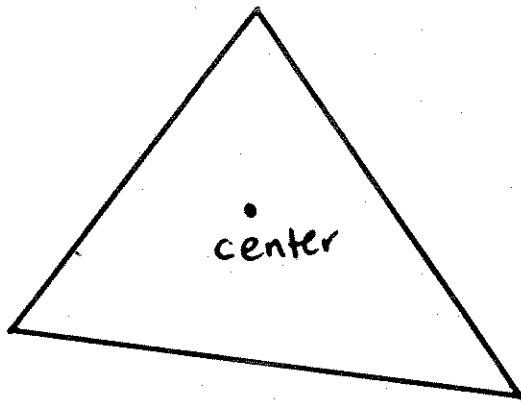
- ⑦ $\angle G$ ⑲ \overline{LJ}
- ⑧ $\angle H$ ⑳ \overline{JK}
- ⑨ $\angle I$ ㉑ $\angle L$
- ⑩ \overline{GH} ㉒ \overline{KL}
- ⑪ \overline{HI} ㉓ $\angle J$
- ⑫ \overline{IG} ㉔ $\angle K$



- ⑲ $\angle S$ ㉑ \overline{LWU}
- ⑳ $\angle T$ ㉒ $\angle V$
- ㉑ $\angle TUS$ ㉓ \overline{VW}
- ㉒ \overline{ST} ㉔ $\angle W$
- ㉓ \overline{TU} ㉕ $\angle VWU$
- ㉔ \overline{US} ㉖ \overline{UV}

7	22	14	24	1	20	15	8	13	17	11	6	23	4	18	3	12	21	16	2	9	5	19	10
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Math 211 – Additive & Multiplicative Comparisons

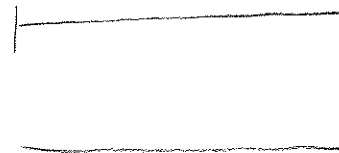
Some practice problems. You may use a calculator if you like. The idea is to get used to the language.

- _____ is 50% of 8.
- _____ is 50% more than 8.
- 24 inches is _____ times as long as 6 inches.
- 24 inches is _____ times longer than 6 inches.
- If your regular pay is \$6 an hour and overtime is time-and-a-half, overtime pays _____ per hour.
- Referring to #5, for overtime you make _____% more per hour than your regular pay.
- 10 cm is 25% longer than _____ cm.
- 10 cm 25% of _____ cm.
- 10 is $\frac{2}{3}$ as much as _____.
- 10 is $\frac{2}{3}$ more than _____.
- An 8:00-9:15 class is _____ times as long as an 8:00-8:50 class.
- An 8:00-9:15 class is _____% longer than an 8:00-8:50 class.
- An 8:00-9:15 class meets _____ as often as an 8:00-8:50 class. (*Both are 3 unit classes*)
- An 8:00-8:50 class meets _____ times as often as an 8:00-9:15 class.
- A cheeseburger has _____% as much meat as a double cheeseburger.
- A double cheeseburger has _____% more meat than a cheeseburger.
- I charge 20% less than what Mike charges for tutoring. Mike charges \$25. So I charge \$_____.
- Chris charges 80% of what Mike charges for tutoring. So Chris charges \$_____.
- A 6-month warranty is _____ times as long as a 60-day warranty.
- A _____-month warranty is 2 times longer than a 60-day warranty.
- A haircut is \$12. Add a shampoo for \$3. A cut and a shampoo cost _____% more than a haircut alone.
- A cut and a shampoo cost _____ times as much as a haircut alone costs.
- A 90° angle is _____ times as large as a 30° angle.
- A 45° angle is 50% larger than a _____ $^\circ$ angle.
- A 90° angle is _____ times as large as a 45° angle.
- A pentagon has _____ as many sides as an octagon has.
- An octagon has _____% more sides than a pentagon has.
- Congratulations! What's left is only _____ as much as you've already done.
- If you drive 50% faster to school, the trip will take _____ as much time.
- If you drive 50% faster to school, the trip will take _____% less time.
- A three-legged dog has _____ times as many legs as a two-legged chicken has.
- A three-legged dog has _____% more legs than a two-legged chicken has.
- 18 cm is $1\frac{1}{2}$ times as long as _____ cm.
- _____ cm is 50% longer than 12 cm.
- 18 cm is _____% longer than 15 cm.
- By answering all the questions, you've done _____% more than a student who answered 30 of them has.

- ① 4
- ② 12
- ③ 4
- ④ 3
- ⑤ 9
- ⑥ 50%
- ⑦ 8
- ⑧ 40
- ⑨ 15
- ⑩ 6
- ⑪ $\frac{3}{2}$
- ⑫ 50
- ⑬ $\frac{2}{3}$
- ⑭ $\frac{3}{2}$
- ⑮ 50%
- ⑯ 100%
- ⑰ 20
- ⑱ 20
- ⑲ 3
- ⑳ 4
- ㉑ 25%
- ㉒ $1\frac{1}{4}$
- ㉓ 3
- ㉔ 30

- ⑳ 2
- ㉑ ~~60%~~ $\frac{5}{8}$
- ㉒ 60%
- ㉓ $\frac{1}{3}$
- ㉔ $\frac{2}{3}$
- ㉕ $33\frac{1}{3}$
- ㉖ $\frac{3}{2}$
- ㉗ 50%
- ㉘ 12
- ㉙ 18
- ㉚ 20%
- ㉛ 20%

700 mph
150 mph.



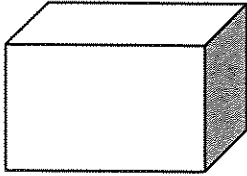
Two shapes are similar if:

Corresponding angles are the same size

Ratio of corresponding sides are all the same length.

Last time, we found the "new area" = (s.f.)²("old area")

Does "new surface area" = (s.f.)²(old surface area)?



Consider this prism with dimensions 3 cm x 4 cm x 5 cm

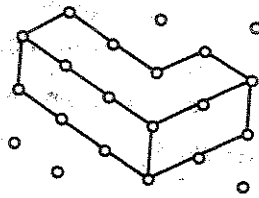
I used a scale factor of $\frac{3}{2}$ and made a new prism with dimensions _____ x _____ x _____.

The volume of the "old prism" is 3cm x 4cm x 5cm = 60 cm³. Why?

And the volume of the "new prism" is _____. Why?

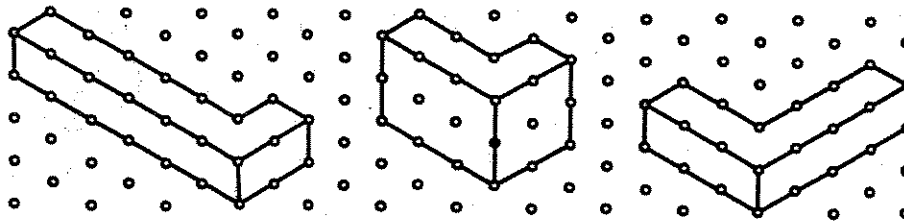
Can you determine the volume of the "new prism" in a different way?

The eccentric billionaire own an L-shaped building like the one below.



She wants another building designed, "shaped exactly like the old one, but twice as large in all dimensions. Make or draw a model shaped like the building that she wants.

Below are some diagrams. Which, if any, of the following drawings will meet the criterion?



Now the billionaire wants a building 3 designed to be shaped like the original, but $\frac{3}{4}$ as large in all dimensions. Make a drawing or describe building 3.