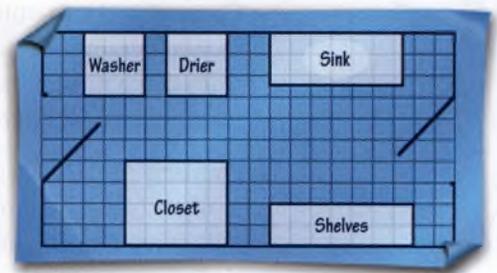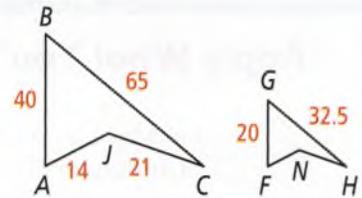**B** Apply **STEM** **Architecture** An architect is using the blueprint below to remodel a laundry room. The side length of each grid square represents 12 in.

19. Find the actual length and width of the sink.

20. Find the total length and width of the actual room.

21. Will it be possible to wheel a laundry cart that is $3\frac{1}{2}$ ft wide through the room from the doorway at the left to the doorway at the right?

22. Model Rockets A particular model rocket kit uses the scale 1 : 144. The actual rocket is 168 ft tall. How tall will the model rocket be when completed?

23. Error Analysis The two figures at the right are similar. A student uses the proportion $\frac{BC}{CJ} = \frac{GH}{FN}$ to find FN.
  a. What mistake did the student make?
  b. What proportion should the student have used instead?

24. Think About a Plan An interior designer sketches a design for a rectangular rug. The dimensions of the sketch are 4 in. by 7.5 in. The dimensions of the actual rug will be ten times the dimensions of the drawing, so the scale of the drawing is 1 : 10. How many times the area of the sketch is the area of the actual rug?
  • Which figures in the problem are similar? What are their dimensions?
  • How can proportions help you find the dimensions of the actual rug?

25. Trucks A model of a tractor-trailer is shaped like a rectangular prism and has a width of 2 in., a length of 9 in., and a height of 4 in. The scale of the model is 1 : 34. How many times the volume of the model is the volume of the actual tractor-trailer?

26. Eiffel Tower The height of the Eiffel Tower is 324 m. Which scale was used to make the model of the Eiffel Tower shown at the right?
  Ⓐ 1 mm : 0.9 m
  Ⓑ 1 mm : 6 m
  Ⓒ 1 mm : 30 m
  Ⓓ 1 mm : 324 m

54 mm

27. Writing Are all squares similar? Explain your answer.

28. Reasoning A boat maker wanted to build a canoe 6 ft long and $2\frac{1}{2}$ ft wide but decided that those dimensions were too small. The boat maker wants to add 2 ft to both the length and the width but also wants to keep the canoe the same shape. Explain why this will not work.