

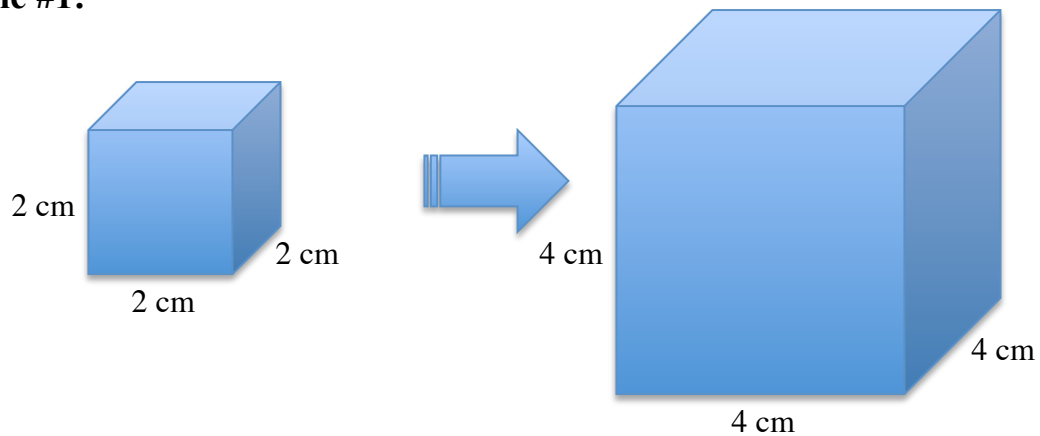
Name: _____

Lesson 2.3 – 3D ObjectsSummary

When scaling any object, each dimension changes according to the scale factor.

When scaling any object, the _____ of any part of the object changes according to the scale factor _____ or squared.

When scaling any object, the _____ of any part of the object changes according to the scale factor _____ or cubed.

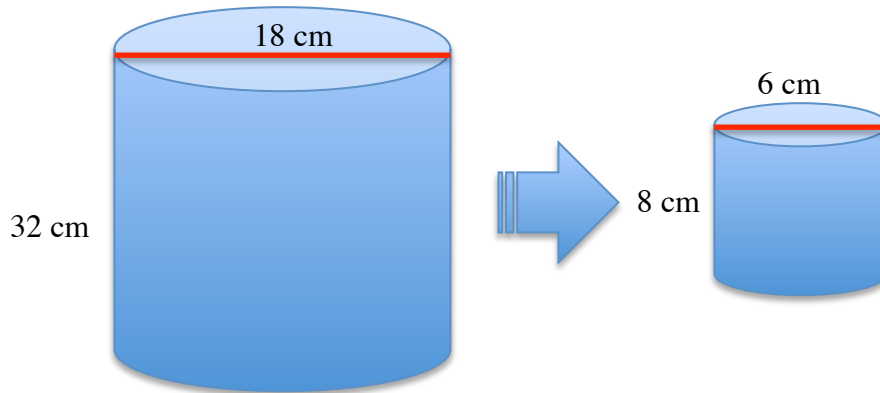
Example #1:

- What scale factor was used to scale this 3D object? _____
- By what factor did the surface area increase? _____
- By what factor did the volume increase? _____

Definition

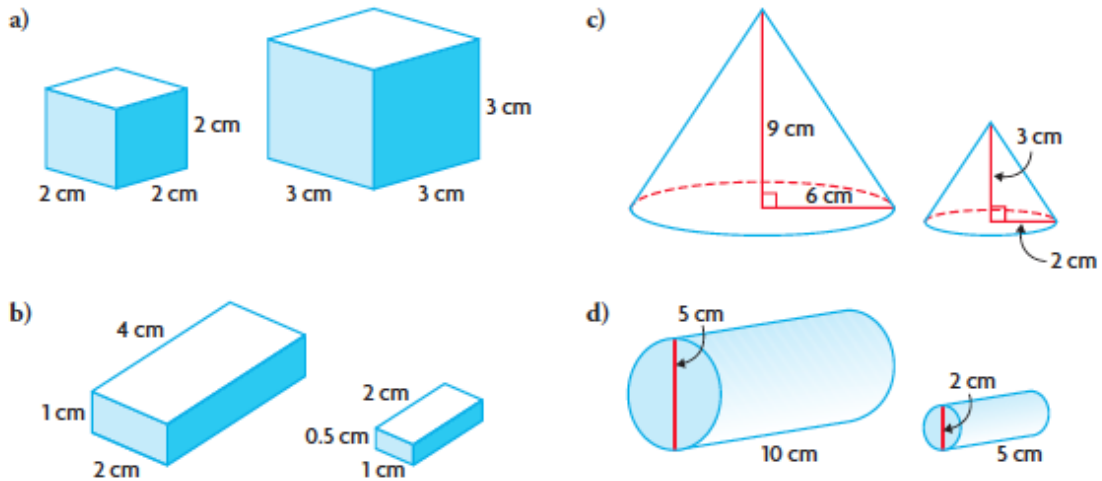
Similar object:

Example #2: Was this scale diagram done correctly? In other words, are these two objects “similar”?



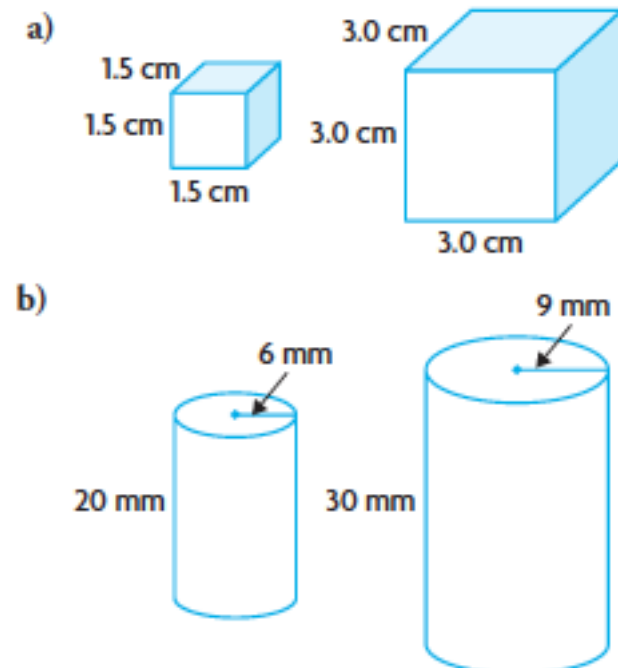
Assignment

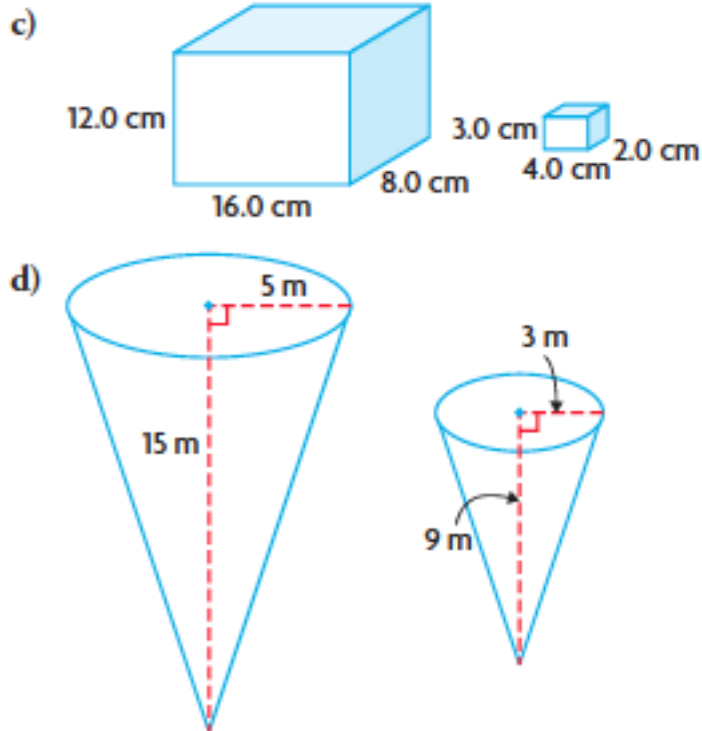
1) For each of the following, determine whether the two objects are similar and justify your decision.



2) Each pair of objects is similar.

- i) By what factor is the surface area of the larger object greater than the surface area of the smaller object?
- ii) By what factor is the volume of the larger object greater than the volume of the smaller object?





3) A stage director needs a pair of large dice for a scene with children playing a board game. He estimates that the measure of each edge of each enlarged die must be 600 mm.



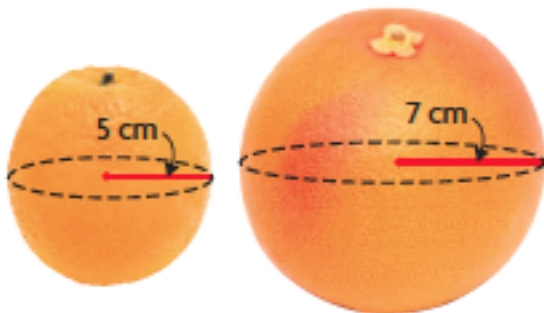
- What scale factor must he apply to create the enlarged dice?
- How many times greater will the surface area of each larger die be?
- How many times greater will the volume of each larger die be?

4) An oil tank has a capacity of 32 m^3 . A similar oil tank has dimensions that are larger by a scale factor of 3. What is the capacity of the larger tank?

5) Brenda is a potter. She is creating two similar vases, with their dimensions related by a scale factor of $\frac{3}{4}$. The larger vase has a volume of 9420 cm^3 . Determine the volume of the smaller vase.

6) A jewellery box has a volume of 4500 cm^3 . Its lid has a surface area of 375 cm^2 . If each dimension of the jewelry box is tripled to create a prop for a theatre production, by what factors would the surface area of the lid and the volume of the box increase?

7) Markian likes both oranges and grapefruits. He wonders how much more fruit he gets in a grapefruit. Estimate how many times greater the volume of a grapefruit is, compared with the volume of an orange.



8) A baseball has a diameter of about 2.9 in. A softball has a diameter of about 3.8 in. By what percent is the amount of leather needed to cover the softball greater than the amount of leather needed to cover the baseball?

Answer Key

1) a) similar b) similar c) similar d) not similar

2) a) i) 4 ii) 8

b) i) $\frac{9}{4}$ ii) $\frac{27}{8}$

c) i) 16 ii) 64

d) i) $\frac{9}{25}$ ii) $\frac{27}{125}$

3) a) 50 b) 2500 c) 125 000

4) 864 m^3

5) 3974 cm^3

6) 9 and 27

7) 2.7

8) 72%