

# Equivalent Figures

Two 3-dimensional figures are "equivalent" if they have the same volume.

1. Carlo has decided to replace his current fish tank with a modern coffee table fish tank. The two fish tanks are equivalent rectangular prisms.

Carlo's old tank:



Carlo's new tank:



The length of the old tank is 90 cm, and the new tank length is  $1\frac{1}{3}$  times the old length.

The width of the new tank is  $1\frac{1}{2}$  times its height.

The height of the old tank is 4 cm more than the width of the new tank.

The width of the old tank is  $\frac{5}{4}$  times the height of the new tank.

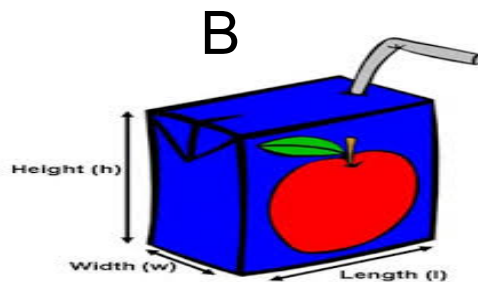
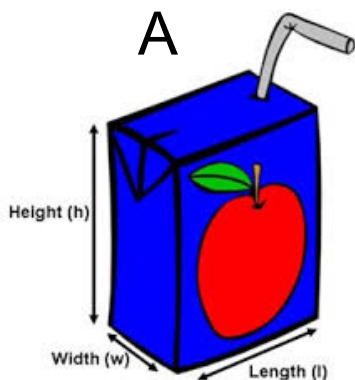
What is the difference in width between the two tanks?

Ans: \_\_\_\_\_

2. A juice box company makes two types of boxes which are each in the shape of equivalent right prisms. Box A has a length of 7 cm, and box B has a length of 10 cm. The height of box A is 2.4 times its width. The width of box B is half the height of box A.

Finally, the height of box B measures 5 cm less than the height of box A.

By how many centimeters does the width of box B exceed the width of box A?



Ans: \_\_\_\_\_

3. A block of wax in the shape of a rectangular prism is melted down to make a pyramidal candle. Consider the following information:

The length of the block is 10cm.

The width of the pyramid is 18cm.

The height of the block is  $1\frac{1}{2}$  times its width.

The length of the pyramid is 4cm longer than the height of the block.

The height of the pyramid is 2cm greater than the width of the block.

Determine how much higher the block is compared to the the pyramid (the difference between the heights).

Volume of pyramid:

$$V = \frac{1}{3}(l)(w)(h)$$



Ans: \_\_\_\_\_

4. The giant toberone shown below is melted down and poured into a mold in the shape of a rectangular prism. The resulting yummy block of toberone has a height of 73cm. Its width is 9cm less than the height of the original toberone bar. The length of the block is  $1\frac{1}{2}$  times the height of the toberone bar. The width of the original toberone bar was 73cm, and its length was 33cm greater than double its height. How much greater is the length of the toberone bar compared to the length of the block?

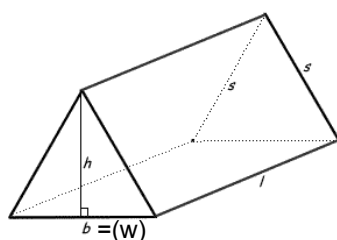
Assume that the toberone bar and the block are equivalent.



Ans: \_\_\_\_\_

Isosceles Triangular Prism

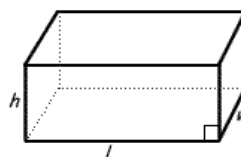
Surface Area  $A = bh + 2ls + lb$



Volume  $V = \frac{1}{2} (bh) l$

Rectangular Prism

Surface Area  $A = 2 (wh + lw + lh)$



Volume  $V = lwh$

5. A company offers two different equivalent dumpsters for rental. These dumpsters are both rectangular prisms. Dumpster A is 300cm long, whereas dumpster B is 183cm long. The width of dumpster A is 4cm greater than double its height. The width of dumpster B is double the height of dumpster A. The height of dumpster B is 40cm less than twice the height of dumpster A. Which dumpster has the greater width? By how much?



Ans: \_\_\_\_\_

Two 2-dimensional figures are "equivalent" if they have the same area.

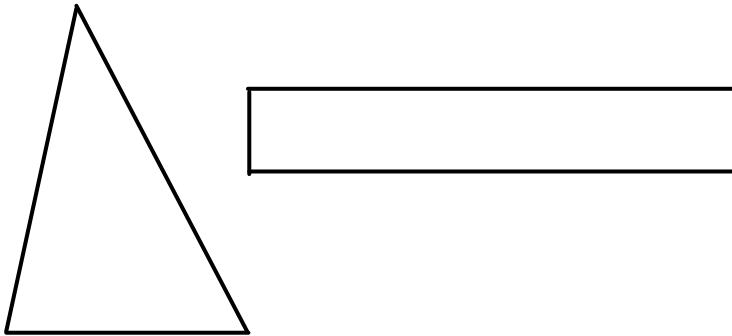
6. The triangle and rectangle below are equivalent.

The base of the triangle is three times the width of the rectangle.

The altitude of the triangle is 2cm greater than its base.

The length of the rectangle is double the base of the triangle.

Determine the altitude of the triangle.



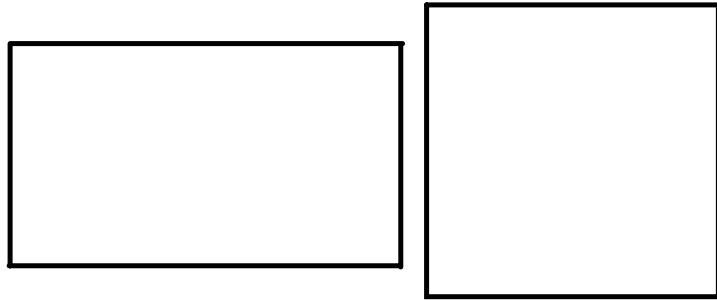
Ans: \_\_\_\_\_

7. The rectangle and square below are equivalent.

The length of the rectangle is 2cm less than double its width.

Each side of the square is 3cm greater than the width of the rectangle.

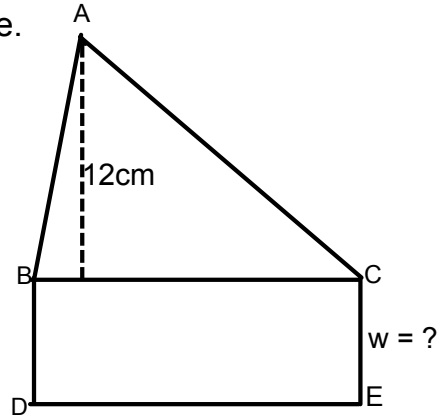
Determine the perimeter of each figure.



Ans: \_\_\_\_\_

8. Triangle ABC and rectangle BCED shown below are equivalent.  
The altitude of the triangle is 12cm.  
The base of the triangle is 10cm greater than the width of the rectangle.

Determine the width of the rectangle.

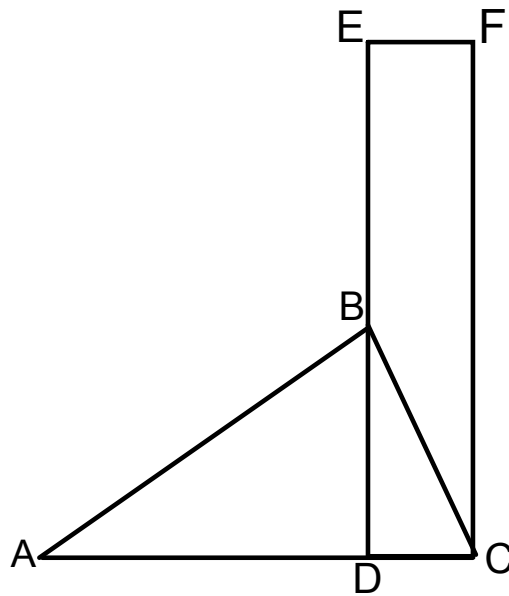


Ans: \_\_\_\_\_





10.



Triangle ABC cuts rectangle CDEF as shown in the above figure.

The altitude of the triangle, BD, is 6cm.

CD is 4cm less than BE. AD is 3cm more than BE.

Triangle ABC and rectangle CDEF are equivalent.

What is the width of the rectangle (i.e. the measure of CD)?

Ans: \_\_\_\_\_

## Answers

1. 10 cm
2. 1 cm
3. 2 cm
4. 63 cm
5. Dumpster A has the greater width.  
Its width is 4cm greater than that of  
dumpster B.
6. 8 cm
7. Perimeter Square = 48 cm  
Perimeter Rectangle = 50 cm
8. 6 cm
9. 64 cm
10. 3 cm

