

### 6.15 PreExam: Area, volume, and density situations

1. Find the area of rectangle  $ABCD$  having length  $l = 11$  and width  $w = 3\frac{3}{5}$ . Start with a formula of this form, substituting the given values:

$$A = l \times w$$



2. Find the weight of a volume of water of 18 cubic feet given that the density of water is 62.4 pounds per cubic foot.

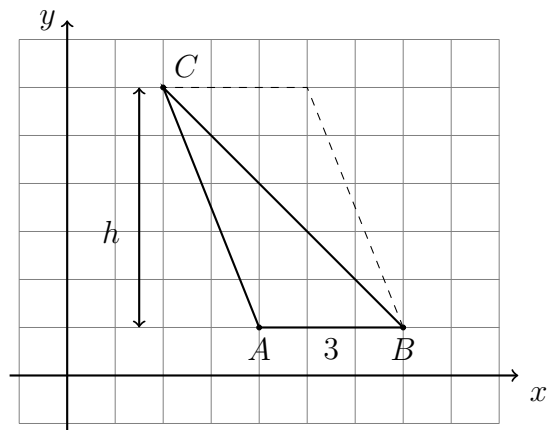
$$W = V \times D$$

3. The  $\triangle ABC$  is shown below with  $A(4, 1)$ ,  $B(7, 1)$ , and  $C(2, 6)$ . The length of the base of the triangle is  $AB = 3$ .

(a) Write down the height  $h$ .

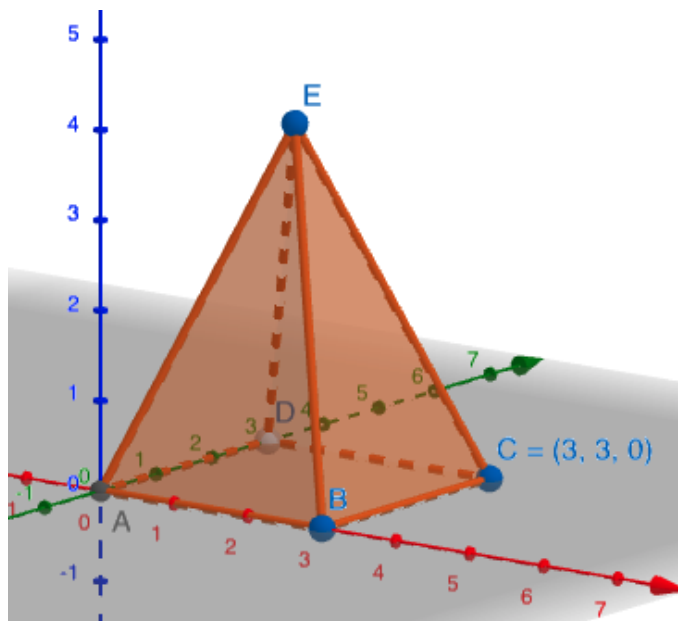
- (b) Find the triangle's area, showing the substitution into the area formula.

$$A = \frac{1}{2}bh$$



4. Find the volume of a pyramid having a square base 3 units on each side,  $s = 3$ , and a height of  $h = 4$ . Show the substitution in the volume formula for full credit.

$$V = \frac{1}{3}s^2h$$



5. The American Eagle gold coin is minted by the US Treasury. The one ounce coin has a radius of about  $r = 16$  millimeters and thickness  $h = 3$  mm. Given a density of  $D = 0.014$  grams per cubic millimeter, find the coin's volume and weight.

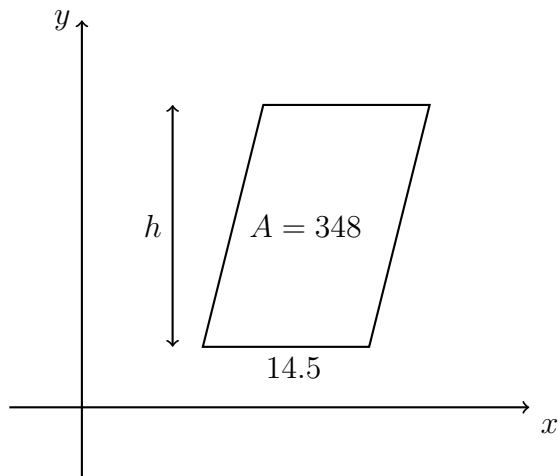
Show the substitution into both formulas for full credit.

$$V = \pi r^2 h \text{ and } W = VD$$



6. A parallelogram is shown on the  $x$ - $y$  plane having a base  $b = 14.5$ , unknown height  $h$ , and area  $A = 348$ . Find the height.

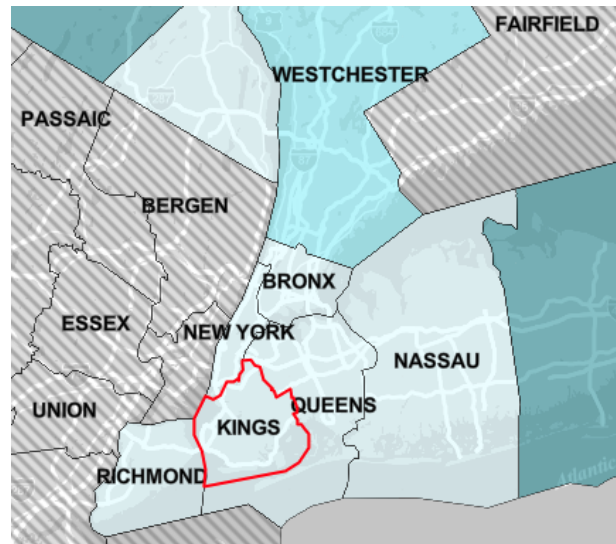
Show the area formula with substituted values for full credit.



7. Find the population density of Brooklyn, New York (Kings County) in people per square mile.

Population estimate July 1, 2019: 2,559,903

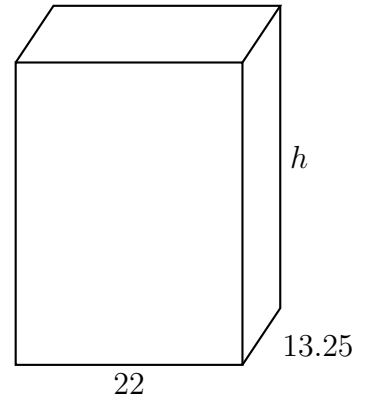
Land area in square miles: 69.4



Source: US Census ([census.gov](https://www.census.gov))

8. The rectangular prism shown has a volume of  $V = 9911$  cubic centimeters. Its base measures  $l = 22$  centimeters by  $w = 13.25$  cm.

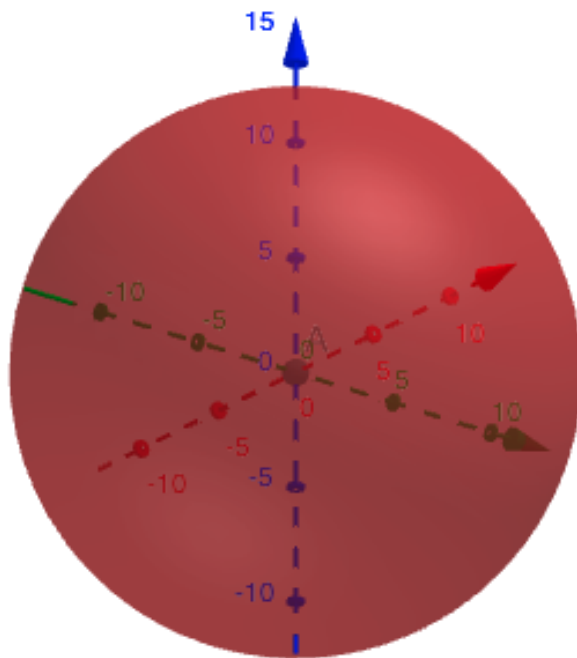
Find its height in centimeters. For credit, begin by writing the volume formula with values substituted.





9. Find the radius of a sphere having a volume of 6367.4 cubic inches. Round to *the nearest tenth of an inch*. Show the substitution in the volume formula for full credit.

$$V = \frac{4}{3}\pi r^3$$



10. A building wall must be painted. Each gallon of paint covers 400 square feet and costs \$34.50. If the wall measures 120 feet wide by 45 feet tall, how much will the paint cost? (assume that paint must be purchased in gallon cans)