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.
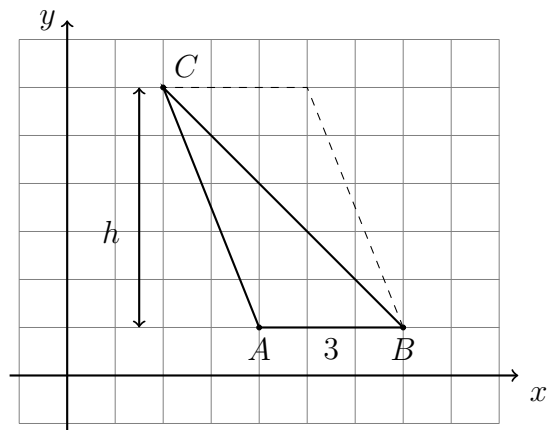
$W = V \times D$

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 $AB = 3$.
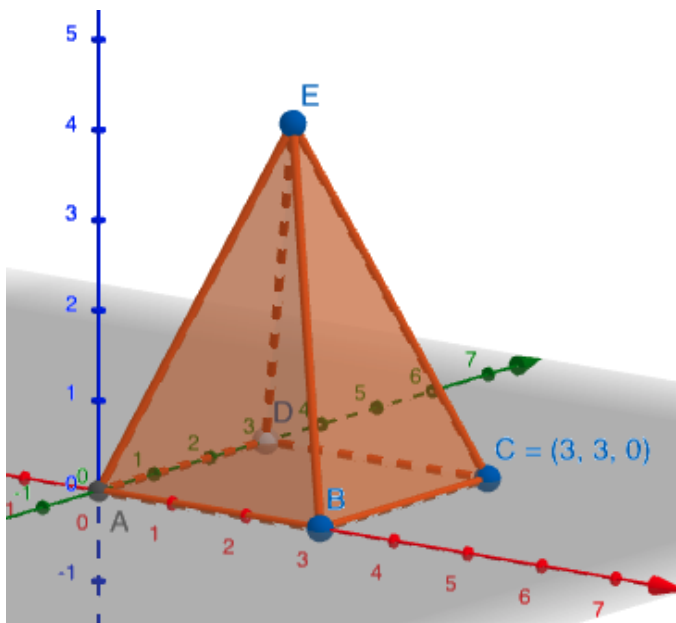
(a) Write down the height h.

(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.
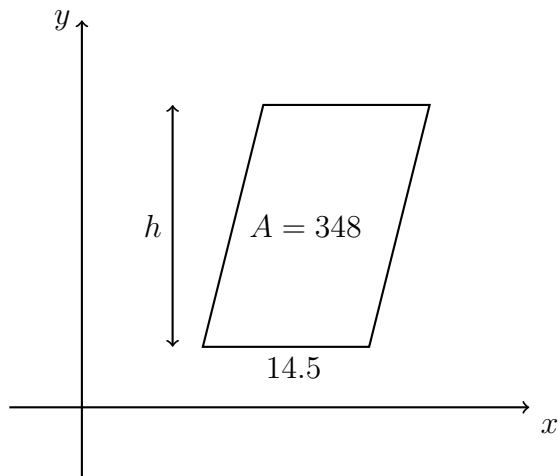
Show the substitution into both formulas for full credit.

$V = \pi r^2 h$ 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.

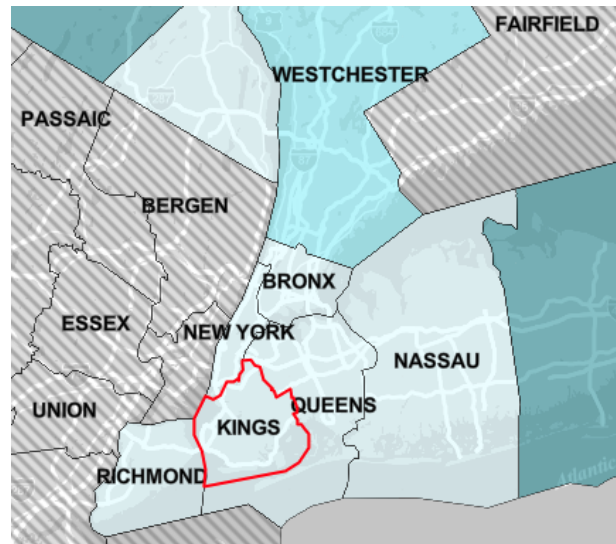Show the area formula with substituted values for full credit.

h

$A = 348$

14.5

7. Find the population density of Brooklyn, New York (Kings County) in people per square mile.
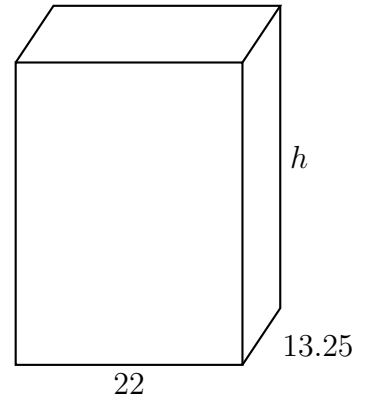
Population estimate July 1, 2019: 2,559,903

Land area in square miles: 35,369

Source: US Census (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.

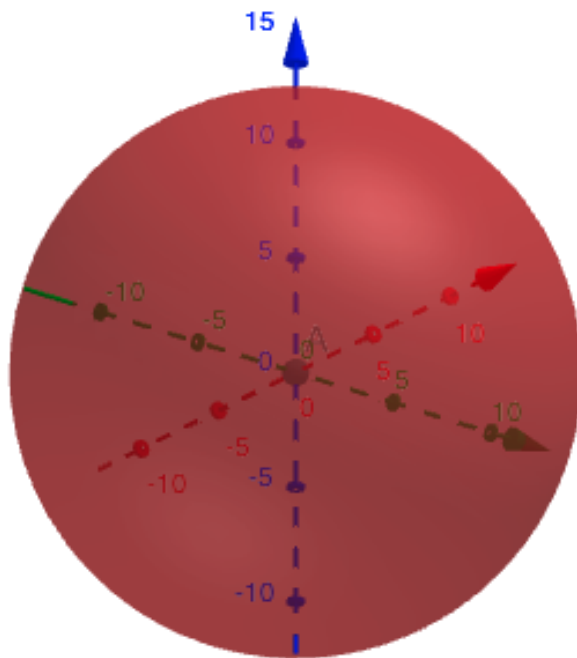Find its height in centimeters. For credit, begin by writing the volume formula with values substituted.

h

13.25

22

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)