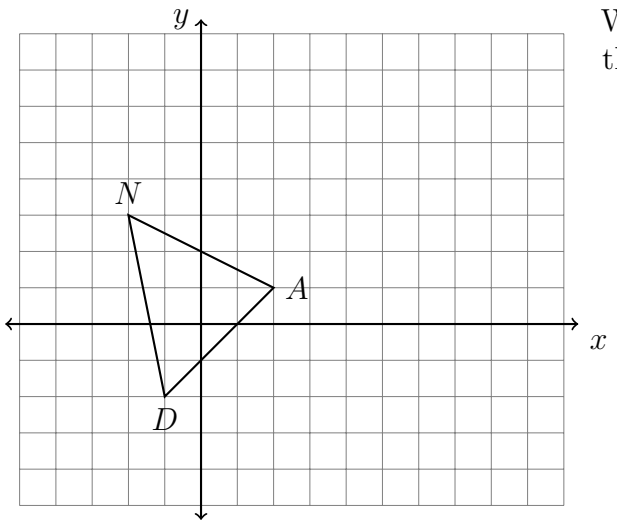
4.6 Homework: Volume of cylinders, cones, pyramids, spheres

1. The vertices of $\triangle DAN$ have the coordinates $D(-1,-2)$, $A(2,1)$, and $N(-2,3)$, as shown below. Apply the translation $(x,y) \to (x+5, y+3)$ to $\triangle DAN$. Draw the image $\triangle D'A'N'$ on the set of axes below, labeling the vertices.



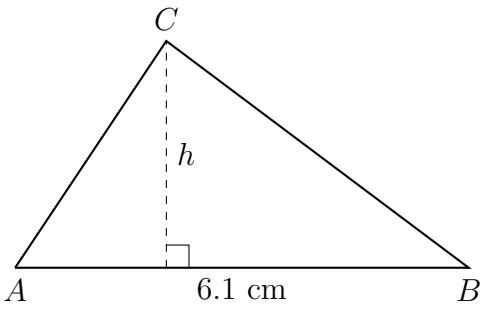
Which triangle has a larger area, or are they equal in area? Justify your answer.

2. What is the volume of a rectangular prism (box) with a base measuring 20 centimeters by 12 cm, and 8 cm tall?

3. What is the volume of an ice cream cone six inches tall and three inches in diameter, *rounded to the nearest whole cubic inch*?

4. The air traffic control zone above Kennedy airport is approximately a cylinder with a radius of 1 mile and height of 1,000 feet. What is the volume of the zone, *to the nearest whole cubic foot*?

5. Find the area of $\triangle ABC$, $Area = \frac{1}{2}bh$. The altitude h of the triangle is 3.25 centimeters and the base $AB = 6.1$ cm.



6. Find the volume of a pyramid ($V = \frac{1}{3}Bh$) having a height of 2 feet and with a square base having side lengths of 30 inches. Express your result to the *nearest cubic foot*.

7. Find the volume of a hemisphere with a radius of three inches, to the *nearest whole cubic inch*. (The formula for the volume of a *sphere* is $V = \frac{4}{3}\pi r^3$)

8. A model rocket is in the shape of a cylinder with a cone-shaped nose cone on top. The diameter of both the cylindrical base and the nose cone is 3 inches. The cylinder section is 12 inches tall and the nose is an additional 3 inches in height.

   Find the volume of the rocket, using the formulas for a cylinder of $V = \pi r^2 h$ and a cone of $V = \frac{1}{3}\pi r^2 h$. Round the result to the *nearest whole cubic inch*.

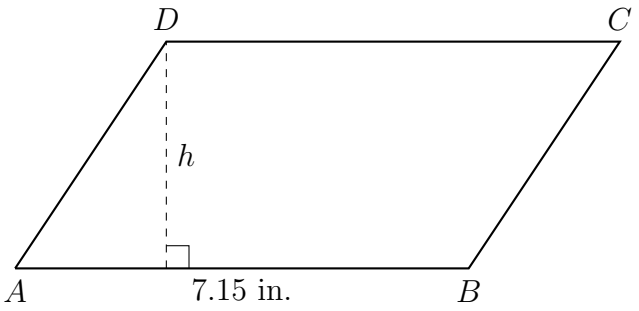
9. Given a rectangle with area 21, width x, and length $x + 4$.

   (a) Find x.

   (b) Find the perimeter of the rectangle.

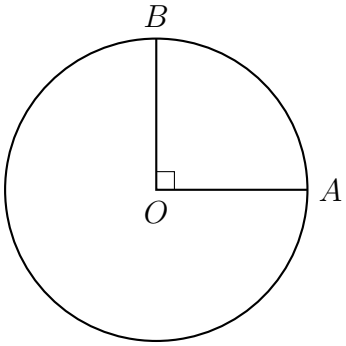
10. Find the volume of a cone having a height of 12 feet and round base with a diameter of 3 feet. Express your result to the *nearest cubic foot*.

11. Find the area of parallelogram $ABCD$. The altitude h of the parallelogram is 4.5 inches and the base $AB = 7.15$ in.



12. Find the volume of a sphere with a radius of 13 inches, to the *nearest whole cubic inch*.

13. Circle O has a radius of 5 inches, and two radii are drawn, OA and OB, as shown. The radii are perpendicular, that is, $m\angle AOB = 90°$.

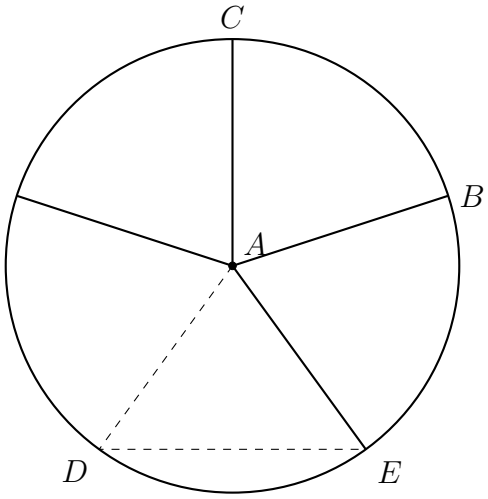


(a) Find the circumference of circle O.

(b) Find the length of the arc $\overset{\frown}{AB}$

Classwork: Circles and angle measures

14. A round pizza is sliced into five equal slices.



(a) What is the *central angle* of a slice? (that is, the $m\angle CAB$)

(b) What is the area of the slice? (one-fifth of the pie)

(c) What is the $m\angle ADE$?

15. Convert $45°$ to radians. (leave your answer in terms of π)

16. Angle A has a measure of 1.2 radians. How much is that in degrees, *rounded to the nearest whole degree*?