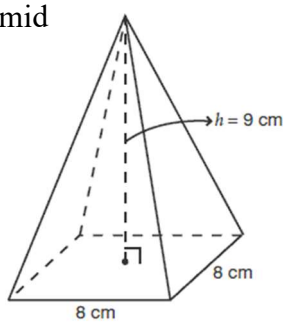
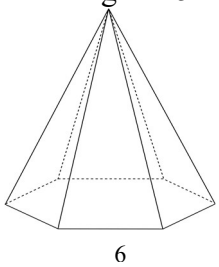
Formal Geometry **11.3 Worksheet** **Show all work on your own paper.**

For #1 – 3, find the volume of each shape. Exact answers only (no decimals.)

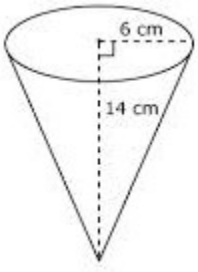
1) square pyramid



2) regular hexagonal pyramid with height = 5.



3) right cone



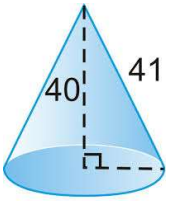
4) Find the volume of a pentagonal pyramid with a base area of 588 square feet and an altitude of 7 feet.

5) A triangular pyramid with a right triangle base with a leg of 8 cm and a hypotenuse of 10 cm has a volume of 144 cm^3. Find the height of the pyramid.

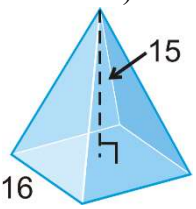
6) A cone has a volume of 196π cm^3. The height of the cone is 12 cm.
Find the diameter of the cone.

For #7 – 8, find the surface area of each shape. Use exact answers only (no decimals.)

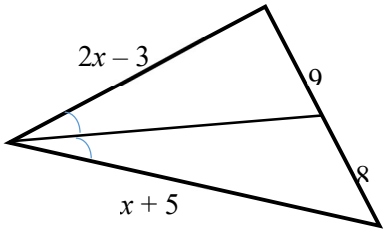
7)



8) square pyramid



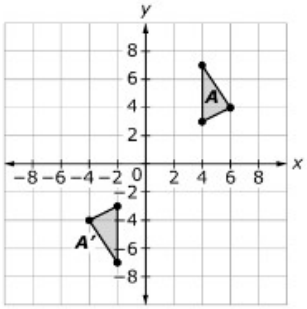
9) Find the value of x in the diagram shown below. If needed, round to one decimal place.



10) Jose and Tina are studying geometric transformations.
Jose is able to move triangle A to triangle A' using the following sequence of basic transformations:

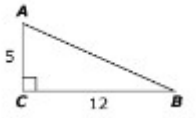
1. reflection across the x-axis
2. reflection across the y-axis
3. translation two units to the right

Tina claims that the same three transformations, done in any order, will always produce the same result. Explore Tina's claim. Is she correct? You must provide evidence (work) for your decision.



11. Consider the right triangle shown. Determine which expressions below are equivalent to the length of AC. Choose all that apply.

A) 13 sin B
B) 13 cos A
C) 12 tan A
D) 12 tan B



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12. Samantha invented a new outdoor game. The game requires attaching a rope between the tops of two vertical poles of different heights. Read the instructions that Samantha created.

Game Instructions

Materials needed: Pole A, Pole B, 10 feet of rope

Setup:

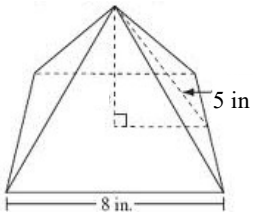
- Place pole A perpendicular to the ground so that its height is 3 feet.
- Place pole B perpendicular to the ground so that its height is 7 feet.
- The length of the rope must extend 6 inches past the top of each pole for proper assembly.
- Attach the rope to the top of the tole poles.

Use all the given information to determine the maximum allowable distance between the base of pole A and the base of pole B, to the nearest foot.

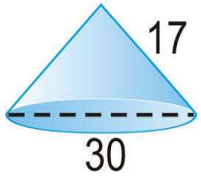
13) If the surface area of a cone is 54π square inches and the radius of the base is 3 inches, then find the slant height of the cone.

For #14 – 15, find the volume of the solid shown. Assume the base of the pyramid is regular.

14)



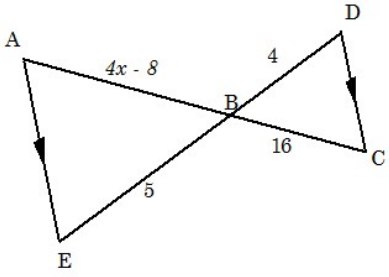
15)



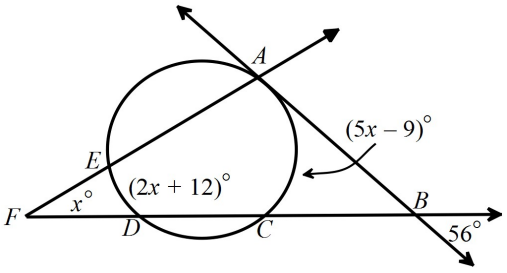
16) A square pyramid is made of stone and has a base of 49 square centimeters and a height of 9 cm. If the pyramid is enclosed in a plastic right prism filled with water, what is the volume of the water?

17) A contractor needs 350 more cubic *yards* of concrete mix to complete a construction job. If there remains a conical pile of concrete mix measuring $72\ feet$ in diameter and $12\ feet$ high, is there enough concrete still on the job site to for her to finish the job? Explain your reasoning.

18) Find the length of $\overline{AB}$.



19) Solve for $m\angle FAB$ in the diagram below.



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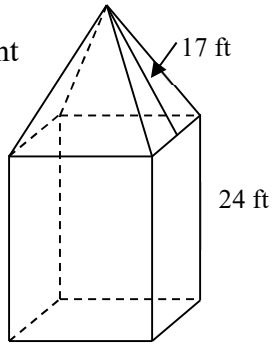
20) Find the volume of the tower shown, if the perimeter of the base is 64 feet and the slant height of the roof is 17 feet, as shown to the right.



21) Given $G(-3, 5)$, plot points $H, J,$ and K such that

- H is a reflection of G over the x-axis
- J is a rotation of H 90 degrees counterclockwise around the origin.
- K is a translation of G such that $(x, y) \rightarrow (x + 8, y + 2)$.

What kind of quadrilateral is GHJK? Explain.

Answers:

1) 192 cm^3 2) $90\sqrt{3}\ u^3$ 3) $168\pi\ cm^3$ 4) 1372 ft^3 5) 18 cm 6) 14 cm
7) 450π u^2 8) 800 u^2 9) 9.9
10) Tina is not correct; work must be shown as evidence for exploring this claim and getting a result different than shown on the graph.
11) A, B, D 12) around 8 feet 13) 15 in 14) 64 in^3 15) 600π u^3 16) 294 cm^3
17) Yes she has 603.19 yd^2 18) 20 19) 103° 20) 7424 ft^3
21) parallelogram, because both pairs of opposite sides have the same slopes and thus are parallel. Slopes of GK and HJ are $\frac{1}{4}$ each; slopes of GH and KJ are each undefined.