

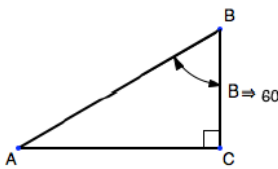
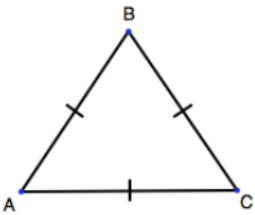
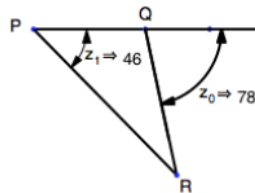
Questions on 5.3 HW?

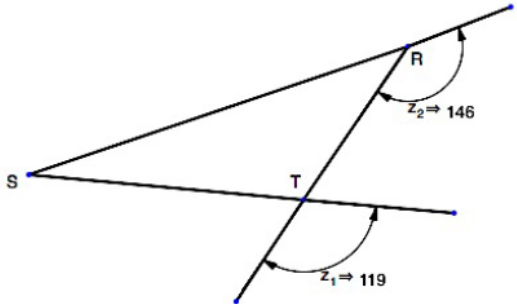
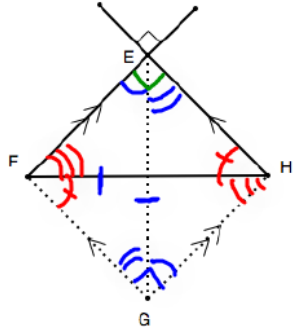
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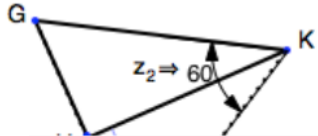
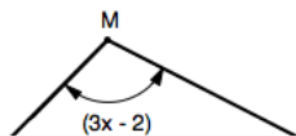
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2.  3.  4. 

5.  6.  $\overline{EG} \cong \overline{FH}$  

7.  8. 

8.50 x 11.00 in

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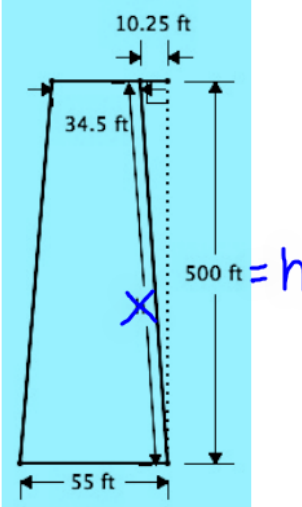
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10. Find the area of each face of the pyramid.

11. Find the area of the 4 trapezoids that make the faces of the frustum.  
 The area of a trapezoid:  $A = \frac{b_1 + b_2}{2} h$  (You will need to find  $h$ )



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19. Find the total volume of the Washington Monument.

Volume of a square frustum:  $V = \frac{1}{3}h(a^2 + ab + b^2)$  where  $a$  and  $b$  are the side lengths of each square.      Volume of pyramid:  $V = \frac{1}{3}l^2h$

$\rightarrow V = \frac{1}{3}(500)(34.5^2 + 34.5(55) + (55)^2)$

$V =$

14. Draw a sketch of the three-dimensional object formed by rotating the figure about the x-axis.

8.50 x 11.00 in

## 5.4 Hard as Nails

### *A Practice Understanding Task*

Tatiana is helping her father purchase supplies for a deck he is building in their back yard. Based on her measurements for the area of the deck, she has determined that they will need to purchase 24 decking planks. These planks will be attached to the framing joists with 16d nails. (Tatiana thinks it is strange that these nails are referred to as "16 penny nails" and wonders where that way of naming nails comes from. After doing some research she has found that in the late 1700s in England the size of a nail was designated by the price of purchasing one hundred nails of that size. She doubts that her dad will be able to buy one hundred 16d nails for 16 pennies.)

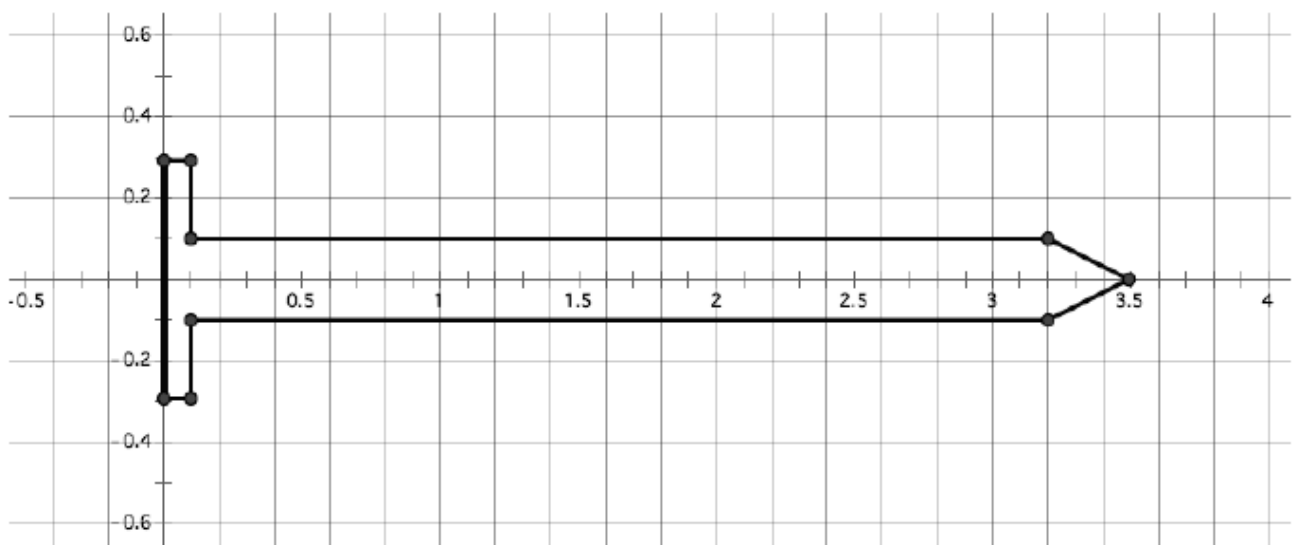


Nails are sold by the pound at the local hardware store, so Tatiana needs to figure out how many pounds of 16d nails to tell her father to buy. She has gathered the following information.

- The deck requires 24 decking planks
- Each plank requires 9 nails to attach it to the framing joists
- 16d nails are made of steel that has a density of 4.65 oz/in<sup>3</sup>
- There are 16 ounces in a pound

$$24 \times 9 = 216 \text{ nails}$$

Tatiana has also found the following drawing of a cross section of a 16d nail. She knows she can use this drawing to help her find the volume of the nail, treating it as a solid of revolution. (Note: The scale on the  $x$ - and  $y$ -axis is in inches.)



1. Devise a plan for finding the volume of the nail based on the given drawing. Describe your plan in words, and then show the computations that support your work.

Total Volume: Vol. of ① cylinder + Vol. of ② cylinder + Vol. of ③ cone

$$V = \pi(0.3)^2(0.1) + \pi(0.1)^2(3.1) + \frac{1}{3}\pi(0.1)^2(0.3)$$

$$V = 0.009\pi + 0.031\pi + 0.001\pi = 0.041\pi \text{ in}^3$$

$$V = 0.028274 + 0.097389 + 0.003142 \approx 0.128805$$

2. Devise a plan for finding the number of pound of 16d nails Tatiana's father should buy. Describe your plan in words, and then show the computations that support your work.

$$216 \times 0.041\pi = 8.856\pi \approx \underline{27.8219 \text{ in}^3}$$

$$\frac{4.65 \text{ oz}}{1 \text{ in}^3} \cdot \frac{27.8219 \text{ in}^3}{1} = 129.372 \text{ oz for } 216 \text{ nails}$$

$$\frac{129.372 \text{ oz}}{1} \cdot \frac{1 \text{ lb}}{16 \text{ oz}} = 8.08575 \text{ lbs}$$

$$\approx \boxed{8.09 \text{ lbs}}$$

# Homework/Classwork

## 5.4 Ready, Set, Go