Week 24 Geometry Assignment

Day 1: pp. 462-463 #1-18
Day 2: pp. 467-468 #1-18
Day 3: pp. 472-474 #1-18
Day 4: pp. 477-479 #1-16
Day 5: Logic worksheets lessons 12, 36, 40

Notes on Assignment:

Pages 462-463:

General notes for this section: These problems are all based on the formulas for the volume of a cube or rectangular prism.

Work to show:
#All problems: Write down the formulas, fill in, and work out.

#9-14: Leave all answers in simplified radical form.

#9: This is a cube, which means each face is a square. Use the Pythagorean Theorem to find the lengths of the sides of the top of the cube.

#10: Draw in the diagonal of the base of this cube. Draw it from the back right vertex to the front left vertex. You should see that this diagonal, the *cube's* diagonal, and the front left vertical edge form a right triangle. Use the Pythagorean Theorem to find the length of an edge like you did on #9, but first you must represent the base's diagonal in terms of the edge. So, using e for the edge lengths of the base and d for the diagonal of the base, use the Pythagorean Theorem and solve for d. Then use this quantity (which will have e in it), the given diagonal of 6, and the front vertical edge e, in the Pythagorean Theorem again. Your equation should only have the variable e in it. Solve for e and then use that to find the volume of the cube.

#11: Using the 2 amounts given for the base, you should be able to find the length of the base. Then using the diagonal of the base and the diagonal of the prism, you should be able to determine how tall this prism is.

#12: Do this the same as #11.

#13: I would suggest finding the volume of the whole solid, including the cut out portion. Then subtract the volume of the cut out portion.

#14: Divide this into pieces.

#15: This is just like problem #10, except the diagonal is x instead of 6. Let the diagonal of the base be d and the edges of the cube be e. Use Pythagorean Theorem using d and e. Then write d in terms of e. Use this, along with the diagonal x and the edge e in the Pythagorean Theorem. Solve for e. Then use the value of e in the formula for a cube.

#16: Let w = the width of the base. How would you represent the length? Use those 2 amounts, along with the height, and put them in the formula, knowing that the volume must equal 3536 cubic feet. Solve for w.

#17: First find the volume of the container. Since each cc of mercury weighs 13.6 grams take your volume and multiply by 13.6 grams. Think of it this way:

$$\_\_\_\_ cm^3\left(\frac{13.6g}{cm^3}\right)$$

The cm^3 terms cancel each other and we are left with grams.

#18: You will use 3 different postulates and/or theorems.

Pages 467-468:

General notes for this section: For any prism, the volume is the area of the base times the height. The formula is V = BH.

Work to show:

#All problems: Write down the formulas, fill in, and work out.

#1: Use the formula for finding the area of an equilateral triangle to find the area of the base.

#2: The 9 is the height of the right triangle.

#3: 4.8 is the apothem of the pentagon.

#5: Remember both bases are identical.

#6: If you are given the area of the base, then you don't have to find it yourself.

#7: This is a heptagon, and you are given the length of its apothem.

#9: Assume this is a rhombus. Use the special area formula for a rhombus.

#10: This is a pentagon, and you are given the length of its apothem.

#12: This is an octagon, and you are given the length of its apothem.

#15: Use the same formula that you used in #9.

#17: See *Cavalieri's Principle*.

Pages 472-474:

General notes for this section: The formula V = BH translates to V = $\pi r^2 H$ when you insert the formula for the area of a circle.

Work to show:
#All problems: Write down the formulas, fill in, and work out.

#7: Refer back to the formula for the lateral surface area (L) of a cylinder. Where did it come from? You need to use this information to find r. Then you will be able to find the volume.

#8: Take your volume formula, fill in what you know, and then solve for what you don't know using algebra.

#10: This is asking how much water will fill the area within the cylinder but outside the cube.

#11: Remember that the surface area is the area of the 2 circular bases and the lateral area. You will need r for both the surface area and the volume. Use the circumference to find r.

#12: For the volume formula you need r and H. You can find r from the circumference. Then you can use that in your volume formula to find H.

#13: Find the volume of the cylinder and see what the length of the rectangular prism would have to be to get the same volume.

#14: After you find the volume in cubic feet, since each cubic foot is 7.5 gallons, multiply your volume times 7.5 to find the number of gallons.

#15: Be careful with your measurement units. You have measurements in feet, inches, and yards. Your answer must be in cubic yards.

#16: Use the dimensions given to find the volume. Disregard the horizontal deviation.

#17: Some silos have a rounded top. This one does not.

#18: Write down the formula V = BH and show how it turns into $V = \pi r^2 H$.

Pages 477-479:

General notes for this section: For any cone or pyramed, the volume is 1/3 times the area of the base times the height. The formula is V = ⅓BH for pyramids and $V = \frac{1}{3} \pi r^2 H$ for cones.

Work to show:

#All problems: Write down the formulas, fill in, and work out.

#1: Assume the base is a square.

#5: The base is a trapezoid.

#7: Use the special area formula for a rhombus that involves the diagonals.

#8-9: Take your volume formula, fill in what you know, and then solve for what you don't know using algebra.

#10: Find the 2 volumes separately and then subtract.

#12: Use the given volume and its formula to find r. Use the relationship between cones and cylinders to find the volume of the cylinder.

#13-14: You will have to subtract some volumes to get these answers.

#15: To find the lateral surface area you will have to find the area of the triangle and multiply it times 4. To find the area of the triangle, you will need the triangle's height, which is the slant height of the pyramid. Use the apothem of the base and the height as the legs of the right triangle in which the slant height is the hypotenuse.

Logic Worksheets lessons 12, 36, 40:

Lesson 12 and 36 – These are reviews of logic and reasoning.

Lesson 40 – This is like a Mind Bender. You can make notes in the squares as you work through the clues.