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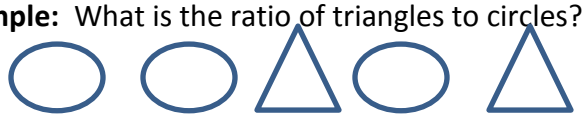
Chapter 3 Study Guide

Topic and Notes	Examples and Practice
Ratio: A way to compare two quantities. A ratio can be written three different ways. 2 to 3 or $\frac{2}{3}$ or 2:3 The order is very important.	**Example:** What is the ratio of triangles to circles?  Trianges: 2 Circles: 3 so 2 to 3 or $\frac{2}{3}$ or 2:3 **Practice:** What is the ratio of gray stars to white stars? 
Proportion: An equation that states two ratios are equal. Set up using words first and then plug in the known values. Cross multiply to solve. Scale Drawings Converting measurements	**Example:** Solve by cross multiplying. $\frac{8}{9} = \frac{5}{x}$ Cross multiply $8x = 45$ Solve for *x* $x = 5.625$ **Practice:** Solve by cross multiplying. $\frac{4}{11} = \frac{7}{x}$ **Example:** A lion eats 34 pounds of meat in 5 days. How many pounds can he eat in 18 days? $\frac{Days}{Pounds} = \frac{5}{34} = \frac{18}{x}$ $5x = 612$ $x = 122.4$ pounds **Practice:** 4 cups of flour are needed to make 18 pancakes. How many pancakes can you make with 26 cups of flour?

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Percents: A percent is out of 100. Use for (is/of) $\frac{is}{of} = \frac{\%}{100}$	**Examples:** 18 is what percent of 25? $\frac{18}{25} = \frac{x}{100}$ $25x = 1800$ $x = 72$ **Practice:** 36 is 58% of what number? 98% of 250 is what number?
Use for word problems $\frac{part}{whole} = \frac{\%}{100}$ Decide which is the part and which is the whole. Check your answer for accuracy.	**Example:** There are 28 students in my class. This is 5% of the school. How many students are in the school? $\frac{28}{x} = \frac{5}{100}$ 28 is part 5 is % $2800 = 5x$ $560 = x$ **Practice:** At the cookout there were 120 hot dogs. 90% of them were eaten. How many were eaten?
Tax/Tip/Discount $\frac{tax/tip/discount}{total} = \frac{\%}{100}$ You add the tax and tip to the total. You subtract the discount from the total.	**Example:** Your meal came to $58. You want to leave a 15% tip. What is the final bill with the tip? $\frac{x}{58} = \frac{15}{100}$ $870 = 100x$ $8.7 = x$ Final bill: 58+8.70=$66.70 **Practice:** You bought a car for $45,000 and the tax is 6.25%. What is the final cost of the car?

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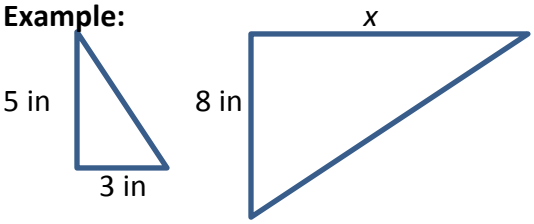
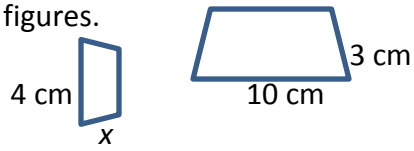
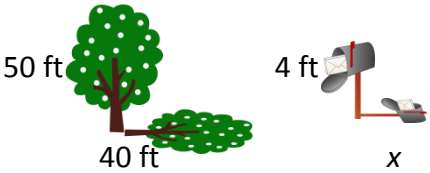
Similar Figures: Same shape but not necessarily the same size. Use tracing paper. Corresponding angles are equal. Corresponding side lengths are proportional. Set up a proportion to find the missing side length. Label your answer.	**Example:**  $\frac{5}{x} = \frac{3}{8}$ $40 = 3x$ 13.3 inches **Practice:** Find the missing side length of the similar figures. 
Shadow Problems: Draw a picture. Set up a proportion. Solve. Label your answer.	**Example:** A tree is 50 feet tall and casts a 15 foot shadow. How long will the shadow of a 4 foot mailbox be?  $\frac{50}{40} = \frac{4}{x}$ $50x = 160$ $x = 3.2$ 3.2 feet **Practice:** A six foot tall man casts a 4.5 shadow. A telephone pole casts a 25 foot shadow. How tall is the telephone pole?

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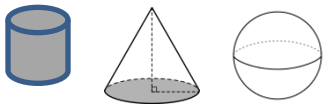
Formulas: Find the correct formula. Plug in the known values. Solve for the unknown value.

Remember:

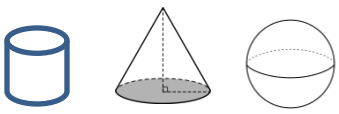
Area- Space covered by a 2-D shape.

Perimeter- Distance around a 2-D shape.

Surface Area- Space that covers all sides of a 3-D figure.



Volume- The amount of space inside a 3-D figure.



Examples and Practice

Example: A cone with a radius of 8 ft. and a height of 12 ft. is filled with cotton candy. How much cotton candy can fit in the cone?

$$V = \frac{1}{3}\pi r^2 h$$
$$V = \frac{1}{3} \cdot 3.14 \cdot 8^2 \cdot 12$$
$$V = 803.84 \text{ feet}^3$$

Practice: A ball is covered in glitter. The radius of the ball is 30 inches. How much glitter is needed to cover the ball?

Practice: My neighbor is putting a fence around his yard. It is 55 feet by 95 feet. How much fencing is needed?

Practice: I made my son a cake in the shape of a cylinder. The cylinder is 6 inches high and has a diameter of 8 inches. How much batter is needed to fit in the cake pan?