Math Makes Sense 7

Chapter: 4: Circles and Area

Keep that GRID PAPER handy – you're gonna need it! You will also need your set of geometry tools – like a compass, various triangles, protractor etc.

NB: When working through the assigned exercises and activities, you should check ALL your answers using the answer guide at the back of the book. Do **NOT** proceed to the next set of questions until you have corrected the section you are working on. I.e.: Do not wait to correct your answers till you have finished the whole page of assigned questions. When you are stuck or not getting something, go back and **re-read** the notes and examples till you understand the concept.

This chapter is mostly about **AREA** – that means squaring things – easy to do in rectangles and squares, but it is a bit trickier in shapes that don't have square (90^o) corners - things like circles (which have Neither corners Nor vertices); and triangles and parallelograms which have vertices, but which aren't SQUARE!

AREA is TWO dimensional and is always reported as some number SQUARED – ie: 22 m^2.

You NEED to KNOW: FORMULAS work really well for finding the area of a shape. It is really helpful if you can memorize them! It is even MORE helpful if you can re-arrange them!!! For example:

Formula for the area of a rectangle, **A = lw** ... this works well when you KNOW both the length and width. But what do you do if you already know the Area and maybe the width, and want to know the length? The magic of formulas is that you can always find the unknown part if you know the other two. Use a real number example to understand this:

If: 12 = 3 x 4, then 4 = 12/3 and 3 = 12/4. ...So if the l is 4 and the w is 3, A = 12

Like: A = 3 x 4, so A = 12.

But...what if I know the A = 20 and the w = 4? ... so, 20 = l x 4 ...find the length by **rearranging** the formula. So, l = 20/4, or l = 5.

Here they are for this chapter:

1. **Circles:** Area: $A = \pi r^2$

Circumference (same as Perimeter for other shapes): $C = 2\pi r$, or $C = \pi d$

2. **Parallellograms:** A = bh Because a //ogram (parallelogram) is similar to a rectangle, this is just an adaptation of the formula for the area of a rectangle (A = lw) ... but since a //ogram is like a triangle, (We'll show you how!) we use triangle words like **b** for **base** and **h** for **height**, instead of **l** for **length** and **w** for **width**!

3. Triangles: A = bh/2 NB: the **base** must ALWAYS be measured at 90^o from the base to the vertex. Notice that this formula is like the //ogram formula.

NB: FORMULA for SUCCESS: ALWAYS start with the FORMULA, then substitute the values into the formula, and follow BEDMAS as you complete the calculation.

Start by taking the **Practice Test** on Pg. 171. When done, calculate your %.

Topic: 4.1 Investigating Circles

Key Words: page 129. Define, illustrate (draw and label a diagram) and/or give an example of ...

Radius, Radii

Diameter

Circumference

π

Irrational number

Base

Height

Circle graph

Sector legend

Percent circle

Central angle

Sector angle

Pie chart (NOT a π-chart!)

vertex

Read and study pages: 130 to 131.

Give special attention to: the diagrams

Practice Q's, page 132: 1 to 6, and 8. Now, for Q. 7, find some circular objects at home and measure the radius and diameter for each object.

Topic: 4.2 Circumference of a Circle

Read and study pages: 133 to 135.

Give special attention to: The examples, diagrams and formulas.

NB: Using FORMULAS – you need to know how to use formulas, especially how to SUBSTITUTE a value into a formula, then how to solve.

Practice Qs: pg 136-137. Do Q's -1 to 6. Now, find a partner (someone who has completed all their work to this point) and co-operate to do Q's 7, 8 and 9.

Mid Unit Review, pg **138 (Preparing for your Mid Unit Quiz)**

Do ALL questions.

Topic: 4.3 Area of a Parallelogram

Read and study pages: 139-141. (How is a //ogram similar to a rectangle???

Give special attention to: cutting and re-arranging the parts into **rectangles!**

Understand that the "**b**" and "**h**" in a //ogram are similar to the "**l**" and "**w**" in a rectangle. Because the //pgram has angles that are NOT 90^{o}, we have to use triangle terminology ... hence **base** and **height** instead of **length** and **width**.

Practice: Qs pg 141: Do 1, 2, 3, 5, 7b, &8. Now, find a partner (someone who has completed all their work to this point) and co-operate to do Q's 9, & 10.

Topic: 4.4 Area of a Triangle

Read and study pages: 143 - 145

Give special attention to: Using a diagonal to cut a //ogram in half creates two congruent triangles, hence, the formula for the area of a triangle shows division by two! ... $A = bh/2$

Practice Q's pg 145:, Q's 1 to 7. Now, find a partner (someone who has completed all their work to this point) and co-operate to do Q's 8, ... and choose ONE of #'s 9-11

Topic: 4.5 Area of a Circle

Read and study pages: 148 - 150

Give special attention to: understanding that subdividing the circle into //ograms is NOT a perfect strategy – a //ogram has STRAIGHT edges, but no part of the circumference of a circle is ever straight ... so we can only approximate.

Practice Q's pg 151-152:, Q's 1 to 4, and #6.

Topic: 4.6 Interpreting Circle Graphs

Read and study pages: 156-158

Give special attention to: Circle graphs are all about representing fractions of (or per cents of) a whole amount ... like 25% of (or ¼ of) the students in a class have brown eyes.

Practice Q's pg 158:, Q's 1 to 4. Share Choose ONE of the rest.

Topic: 4.7 Drawing Circle Graphs

Read and study pages 161 to 162. The trick here is that you have to convert your fractional amounts into a number of degrees. There are 360 degrees in a circle, so if 25% of the students have brown hair, then 25% of 360 is 90. So, to represent 90 degrees in a circle, you would have to use a protractor to measure 90^{o} of a circle.

Do Practice Q's 1, 2, 3 and 5. Partner up for #'s 3 and 5.

Topic: 4.8 Using Spreadsheets to Create Circle Graphs

Read and study pages 165 166.

Try copying the example, then try to do Q 1 on pg. 166

Unit Review, pg 167-170. **First, go over the "What Do I Need to Know" section.** Now do all the questions in the Review.

Practice Test: Finish by taking the Practice Test on Pg. 171. When done, calculate your %.

Now you are ready for your Chapter Test.