

GCSE Maths

ASSIGNMENT

Preparatory Sheet

Required preparation for the session on.....

CIRCLES AND NAMING PARTS, FIND ARC LENGTH, AREAS, VENN

Aims of this session: Review your abilities in each of these areas, Green (feel confident..G), Amber (need to work more on..A), Red (Feel weaker at this..R)

1. Name parts of a circle
2. Find 'pi' and use to calculate the circumference of a circle
3. Calculate an arc length
4. Calculate the area of a whole circle
5. Find the area of a sectors of a circle (or semi-circle)
6. Use Venn diagrams to categorise sets of information

G	A	R
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MOSTLY GREEN

MOSTLY ORANGE

MOSTLY RED

START <https://padlet.com/mathsman230774/krorlp7qyuod>

Watch the video/s, read and practice

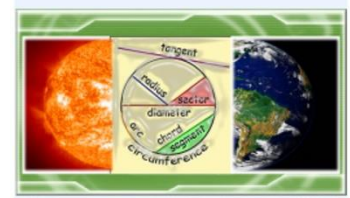
using the online materials. Read your GCSE maths AQA book



S14 Circles and parts of circles



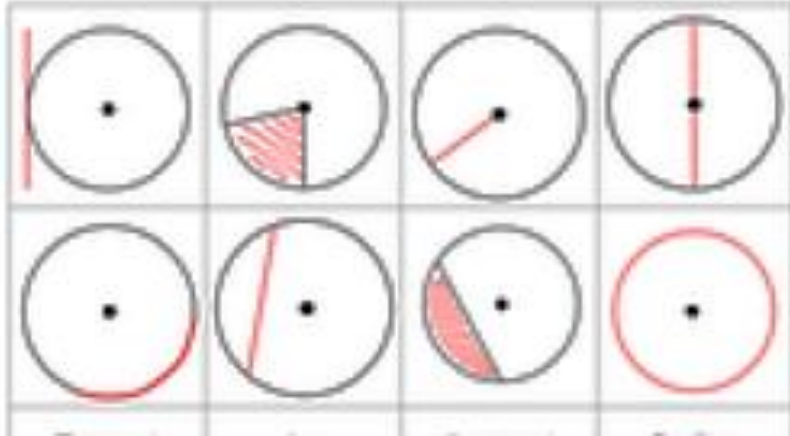
Write a comment about what you learned from the videos / materials below



1.

Name parts of a circle.

Q To get started you first need to know a bit about a circle, what seems at first a very simple shape. But there is a lot to circles and they can be very useful in maths in solving lots of problems. You need to learn the parts of a circle and their names. Look them up and think of some good ways to memorise them! Once you are ready, look at the circle parts below and see if you can name them.



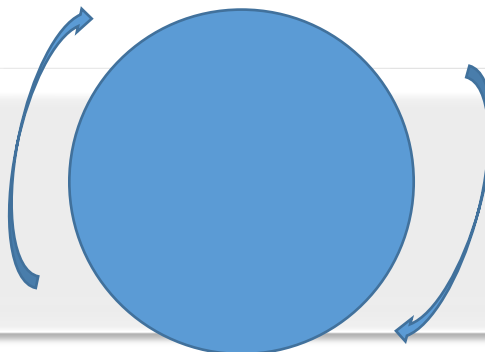
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2.

Find 'pi' and use to calculate the circumference of a circle

Q The distance around a circle is difficult to measure but a really useful value when dealing with rotating objects such as wheels and motors or planets orbiting. A straight-line measurement cannot be found by just counting units off a ruler. Can you think of another way of getting around a circle and taking a measurement all the way around?....



HINT...what could you use to go around the outside? Are there parts of the circle you could measure and use that are in a straight line to help you to find its circumference? Do the terms 'radius' or 'diameter' mean anything?

3.

Calculate an arc length

Q The answer to getting all the way around a circle and measuring how far it is lies with a special value called 'Pi' This is a number 3.14..... which relates the circle's diameter to its circumference. If you multiply the diameter of a circle by 3.14.... you get (approximately) the value of the circumference.

$$3.14 \times \text{diameter} = \text{circumference}$$

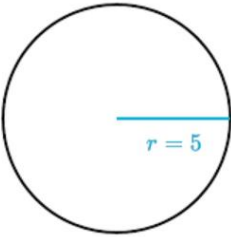
If you do not want to go all the way round a circle you will travel an ARC LENGTH. This is just a fraction of the whole circle. Can you write a method of finding an 'Arc Length'? Can you find an arc length of a circle with diameter of 3metres and angle 60 degrees?

Hint:... the circumference is all the way round. Multiply this value by the fraction of the distance you have travelled. Think about how this fraction comes about (angles maybe?!!!)

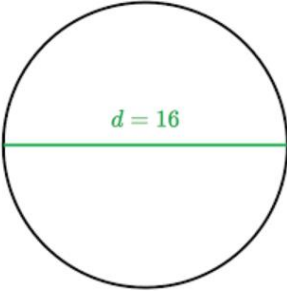
4.

Calculate the area of a whole circle

Q A difficult maths problem was at first unsolved and that was, how to find the area of a circle. There are no straight lines/sides to measure with a ruler and multiply like a rectangle to get the area (length x width). Good estimations were used by the Greeks over time but it wasn't until Newton and an area of maths called 'Calculus' that we could get very accurate approximations of circle areas. Go ahead and watch a good video on finding the area of a circle before the tutor session etc. The result is a formula $\pi r^2=A$ Use this formula to find the area of the two circles below.



A circle with a blue radius line extending from the center to the right edge, labeled $r = 5$.



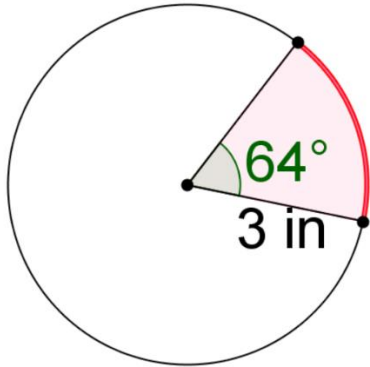
A circle with a green diameter line extending across the center from the left edge to the right edge, labeled $d = 16$.

Hint:... π is the value 3.14 in most cases. Multiply this by the radius and then again by the radius. This is the area of the circle! If you are given the diameter instead just halve this value and then you get the radius!

5.

Find the area of a sectors of a circle (or semi-circle)

Q Similar to 'Arc lengths' we do not always need to find the area of the whole circle. If you sweep out part of the way around a circle you get a 'Sector'. This part or sector of the circle is part of the whole area. Think of a way of using a given angle 'swept' around a circle to find its area and use this below to find the sector area shown.



Hint:... this circle has a radius of 3 inches. The angle swept around the circle is only 64 degrees out of the full 360 degrees. This is a fraction of the circle. You can multiply this fraction $64/360$ by the whole circle to get the 'Sector area'.

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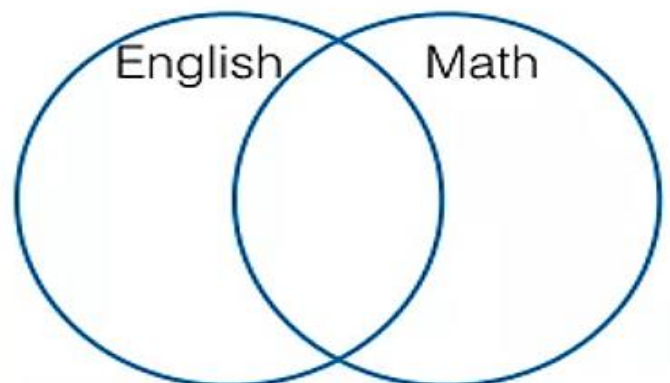


6.

Use Venn diagrams to categorise sets of information

Q Circle can be used in a variety of ways. Here, two overlapping circles can be used to show how information is sorted, data sets divided up and shared. These are called 'Venn Diagrams'. Use moodle and books etc to familiarise yourself with what venn diagrams are and then try to sort the information shown below into the correct sections.

- 7 learners will pass English
- 9 learners will pass Maths
- 4 learners will pass both Maths and English
- 3 learners will not pass any

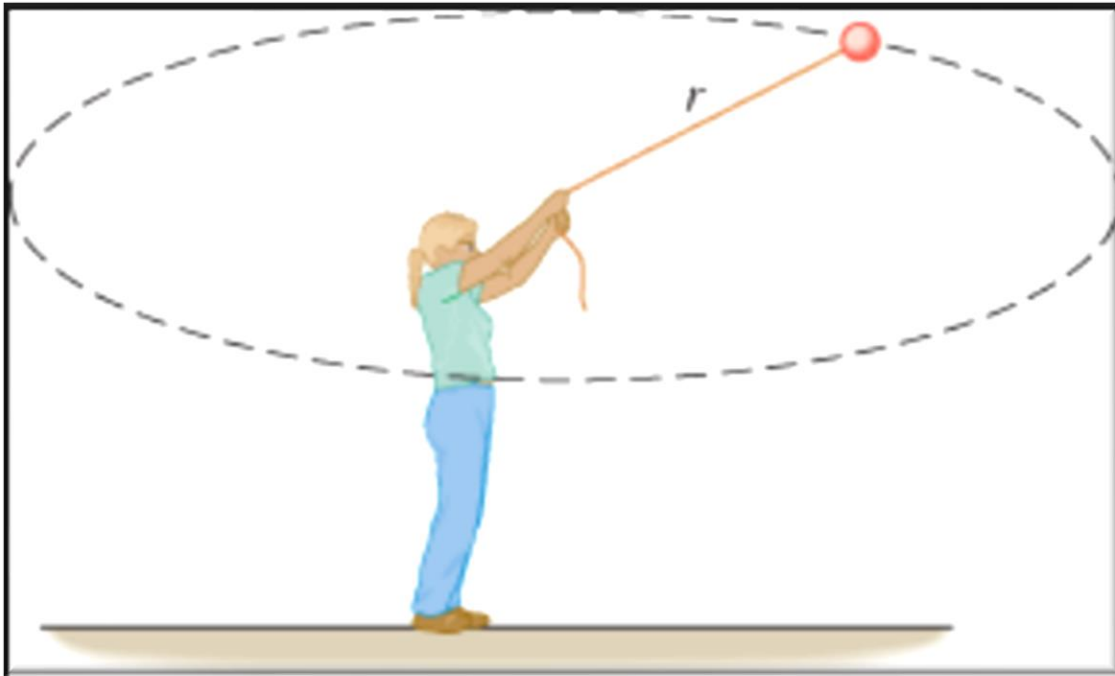


Hint:.... Start with the 4 learners that will pass both English and Maths. Those 4 people will be in the lap over between English and Maths. When next looking at how many pass English only, think.... You have already put 4 of those learners in the English circle already! How many are left? etc

END OF PREPATORY ASSIGNMENT

What to do now....

1. Ensure you have marked in each box if you feel confident in each topic or not (this will inform you and your tutor which activities you should do in the session)
2. Bring this yellow assignment with you to your next session and check with your tutor answers given
3. Add this to your folder of work IN ORDER YELLOW...ORANGE... (and any BLUE you achieve)!



$$2\pi r$$

$$\pi r^2$$

$$\theta/360 \times 2\pi r$$

$$\theta/360 \times \pi r^2$$

