|  |  |  |
| --- | --- | --- |
| **Topic/Skill**  | **Definition/Tips** | **Example****Topic: Circumference and Area**  |
| 1. Circle | A circle is the locus of all points equidistant from a central point. | Image result for math definition circle |
| 2. Parts of a Circle | **Radius** – the **distance** from the **centre** of a circle to the **edge****Diameter** – the total **distance** across the **width** of a circle **through the centre**.**Circumference** – the **total distance** around the **outside** of a circle**Chord** – a **straight line** whose **end points lie on a circle****Tangent** – a **straight line** which **touches** a circle at exactly **one point****Arc** – a **part of the circumference** of a circle**Sector** – the **region** of a circle enclosed by **two radii** and their intercepted **arc****Segment** – the **region** bounded by a **chord** and the **arc** created by the chord | Image result for parts of a circle |
| 3. Area of a Circle | $A=πr^{2}$ which means ‘pi x radius squared’. | If the radius was 5cm, then:$$A=π×5^{2}=78.5cm^{2}$$ |
| 4. Circumference of a Circle | $C=πd$ which means ‘pi x diameter’ | If the radius was 5cm, then:$$C=π×10=31.4cm$$ |
| 5. $π$ (‘pi’) | Pi is the circumference of a circle divided by the diameter.$$π≈3.14$$ |  |
| 6. Arc Length of a Sector | The arc length is part of the circumference.Take the **angle** given **as a fraction over 360°** and **multiply** by the **circumference**. | Arc Length = $\frac{115}{360}×π×8=8.03cm$ |
| 7. Area of a Sector | The area of a sector is part of the total area.Take the **angle** given **as a fraction over 360°** and **multiply** by the **area**. | Area = $\frac{115}{360}×π×4^{2}=16.1cm^{2}$ |

|  |  |  |
| --- | --- | --- |
| **Topic/Skill**  | **Definition/Tips** | **Example****Topic: Pythagoras’ Theorem**  |
| 1. Pythagoras’ Theorem | For any **right angled triangle**:$$a^{2}+b^{2}=c^{2}$$Used to find **missing lengths**.a and b are the shorter sides, c is the **hypotenuse** (**longest side**). |  |
| 2. 3D Pythagoras’ Theorem | Find missing lengths by **identifying right angled triangles**.You will often have to find a missing length you are not asked for before finding the missing length you are asked for. | Can a pencil that is 20cm long fit in a pencil tin with dimensions 12cm, 13cm and 9cm? The pencil tin is in the shape of a cuboid.Hypotenuse of the base = $\sqrt{12^{2}+13^{2}}=17.7$Diagonal of cuboid = $\sqrt{17.7^{2}+9^{2}}=19.8cm$No, the pencil cannot fit. |
| **Topic/Skill**  | **Definition/Tips** | **Example****Topic: Volume**  |
| 1. Volume | Volume is a measure of the amount of space inside a solid shape.Units: $mm^{3}, cm^{3},m^{3}$ etc. | Image result for math definition volume |
| 2. Volume of a Cube/Cuboid | $$V=Length×Width×Height$$$$V=L×W×H$$You can also use the Volume of a Prism formula for a cube/cuboid. | Image result for volume cuboid |
| 3. Prism | A prism is a 3D shape whose **cross section is the same** throughout. | Image result for math definition prism |
| 4. Cross Section | The **cross section** is the **shape** that **continues** all the way **through the prism**. |  |
| 5. Volume of a Prism | $$V= Area of Cross Section×Length$$$$V=A×L$$ |  |
| 6. Volume of a Cylinder | $$V=πr^{2}h$$ |  |
| 7. Volume of a Cone | $$V=\frac{1}{3}πr^{2}h$$ |  |
| 8. Volume of a Pyramid | $$Volume= \frac{1}{3}Bh$$where B = area of the base | $$V=\frac{1}{3}×6×6×7=84cm^{3}$$ |
| 9. Volume of a Sphere | $$V=\frac{4}{3}πr^{3}$$Look out for hemispheres – just halve the volume of a sphere. | Find the volume of a sphere with diameter 10cm.$$V=\frac{4}{3}π(5)^{3}=\frac{500π}{3}cm^{3}$$ |
| 10. Frustums | A frustum is a solid (usually a cone or pyramid) with the **top removed**.Find the volume of the whole shape, then take away the volume of the small cone/pyramid removed at the top. | **Topic: Geometry and Measures (H)** $$V=\frac{1}{3}π\left(10\right)^{2}\left(24\right)-\frac{1}{3}π\left(5\right)^{2}\left(12\right)=700πcm^{3}$$ |

**Knowledge Organiser**