 **Powers and Roots (No calculator)**

|  |  |  |
| --- | --- | --- |
| **Literacy**Describe through examples the differences between the words “base number” and “index number” | **Research**Why are base 2 numbers so important to the technological changes we have been seeing in your lifetime so far? Summarise your thoughts in no more than (In 1100100 base 2) words! | **Memory**You need to learn how to use and apply the following index laws:  $a^{0} $= 1 $a^{-n} $= $\frac{1}{a^{n}}$ $a^{\frac{m}{n}}= \left(\sqrt[n]{a}\right)^{m}$ |
| **Skills**1. Evaluate the following: a) $7^{0}$ b) $27^{\frac{1}{3}}$ c) $6^{-2}$ d) $8^{-1}$ e) $9^{\frac{1}{2}}$ f) $\left(\frac{2}{3}\right)^{-2}$  g) $16^{\frac{3}{4}}$ h) $125^{-\frac{4}{3}}$  2. Estimate the answers to a) $\sqrt{70}$ b) $\sqrt[3]{200}$ c) $4.7^{3}$ d) $\sqrt[3]{24000}$  3. I am an odd two-digit number but I am not a prime number. If you reverse  me and add me to myself, you get a square number. If you reverse me  and subtract me from myself, you get another square number. Who am I?  4. Rewrite the following as a single power of k: $\left(\frac{1}{k}\right)^{-\frac{3}{2}}$ | **Stretch**  1. Find the value of n in the following  equation $3^{2n}= 27^{4}$2. If $3^{d}$ = 8 and $3^{e}$ = 5, what is the value of a) $3^{2d}$ b) $3^{d+e}$ c) $3^{3d-2e}$ 3. What is this cartoon  about?  |

 **Powers and Roots (No calculator)**

|  |  |  |
| --- | --- | --- |
| **Literacy**Describe through examples the differences between the words “base number” and “index number” | **Research**Why are base 2 numbers so important to the technological changes we have been seeing in your lifetime so far? Summarise your thoughts in no more than (In 1100100 base 2) words! | **Memory**You need to learn how to use and apply the following index laws:  $a^{0} $= 1 $a^{-n} $= $\frac{1}{a^{n}}$ $a^{\frac{m}{n}}= \left(\sqrt[n]{a}\right)^{m}$ |
| **Skills**1. Evaluate the following: a) $7^{0}$ b) $27^{\frac{1}{3}}$ c) $6^{-2}$ d) $8^{-1}$ e) $9^{\frac{1}{2}}$ f) $\left(\frac{2}{3}\right)^{-2}$  g) $16^{\frac{3}{4}}$ h) $125^{-\frac{4}{3}}$  2. Estimate the answers to a) $\sqrt{70}$ b) $\sqrt[3]{200}$ c) $4.7^{3}$ d) $\sqrt[3]{24000}$  3. I am an odd two-digit number but I am not a prime number. If you reverse  me and add me to myself, you get a square number. If you reverse me  and subtract me from myself, you get another square number. Who am I?  4. Rewrite the following as a single power of k: $\left(\frac{1}{k}\right)^{-\frac{3}{2}}$ | **Stretch**  1. Find the value of n in the following  equation $3^{2n}= 27^{4}$2. If $3^{d}$ = 8 and $3^{e}$ = 5, what is the value of a) $3^{2d}$ b) $3^{d+e}$ c) $3^{3d-2e}$ 3. What is this cartoon  about?  |