# Year 10 – Maths – Autumn 1 [Page 1 of 2]

| Unit 1 - surds | | | |
|---|---|---|---|
| **No.** | **Question** | **Answer** | **HIGHER** |
| 1.1 | A surd is | An irrational root | X |
| 1.2 | $\sqrt{a} \times \sqrt{b}$ | $\sqrt{ab}$ | X |
| 1.3 | $\sqrt{\frac{a}{b}}$ | $\frac{\sqrt{a}}{\sqrt{b}}$ | X |
| 1.4 | $\sqrt{a} + \sqrt{a}$ | $2\sqrt{a}$ | X |
| 1.5 | $\sqrt{a} - \sqrt{a}$ | 0 | X |
| 1.6 | $\sqrt{a} \times \sqrt{a}$ | $a$ | X |
| 1.7 | $(\sqrt{a} + 1)(\sqrt{a} - 1)$ | $a - 1$ | X |
| 1.8 | $a \times a$ | $a^2$ (“a squared”) | |
| 1.9 | $a \times a \times a$ | $a^3$ (“a cubed”) | |
| 1.10 | $a \times a \times a \times a$ | $a^4$ (“a to the power of 4”) | |
| 1.11 | $\pm\sqrt{25}$ | The square roots of 25 are 5 and -5 | |
| 1.12 | $\sqrt[3]{64}$ | “The cube root of 64 is 4” | |
| 1.13 | Index | The power | |
| 1.14 | $a^b \times a^c$ | $a^{b+c}$ | |
| 1.15 | $\frac{a^b}{a^c}$ | $a^{b-c}$ | |
| 1.16 | $(a^b)^c$ | $a^{bc}$ | |
| 1.17 | $a^0$ | 1 | |
| 1.18 | $a^{-b}$ | $\frac{1}{a^b}$ | X |
| 1.19 | $a^{\frac{b}{c}}$ | $\sqrt[c]{a^b}$ | X |
| 1.20 | Standard form | A way of writing numbers in the form $a \times 10^n$ where a must be between 1 and 10 and n is an integer | |
| 1.21 | $10^{-2}$ | 0.01 | |
| 1.22 | $10^{-1}$ | 0.1 | |
| 1.23 | $10^0$ | 1 | |
| 1.24 | $10^1$ | 10 | |
| 1.25 | $10^2$ | 100 | |
| 1.26 | $10^3$ | 1000 | |
| 1.27 | 0.0004 in standard form… | $4 \times 10^{-4}$ (the number must be between 1 and 10) | |
| 1.28 | 40000 in standard form… | $4 \times 10^4$ (the number must be between 1 and 10) | |

| Unit 2 - % increase and decrease | | | |
|---|---|---|---|
| **No.** | **Question** | **Answer** | **HIGHER** |
| 2.1 | % increase (non calculator) | Find the % and add it on | |
| 2.2 | % decrease (non calculator) | Find the % and take it away | |
| 2.3 | % Change (calculator) | **original x % multiplier** | |
| 2.4 | Compound Percentages | **original x % multiplier** $^{\text{time interval}}$ | |
| 2.5 | Convert a fraction to a decimal | Make the denominator 10 or 100 OR divide the numerator by the denominator | |
| 2.6 | Convert a decimal to a % | X 100 | |

| **Date (week commencing)** | **Numbers to learn** |
|---|---|
| **01/11/21** | **4.1 - 4.6 & 1.14 – 1.17** |
| **08/11/21** | **4.1 – 4.9 & 1.14 – 1.19** |
| **15/11/21** | **6.1 – 6.4 & 4.1 – 4.9** |
| **22/11/21** | **6.4 – 6.13 & 2.1 – 2.6** |
| **29/11/21** | **6.1 – 6.13 & 1.2 – 1.6** |
| **06/12/21** | **4.1 – 6.13** |
| **13/12/21** | **1.1 – 6.13** |

***Learning means…***

I am using look >> cover >> write >> check at least twice for this week’s facts

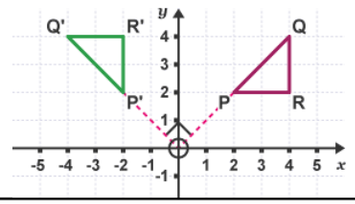
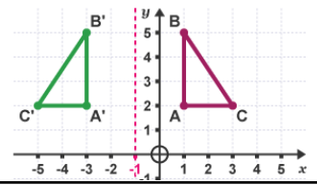
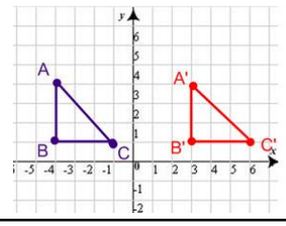
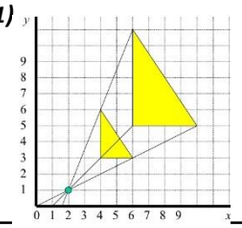
and/or

I made flash cards ( “Question” on one side and “Answer” on the other) for the facts and got someone to test me on them at least twice

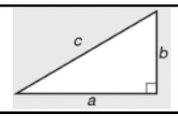
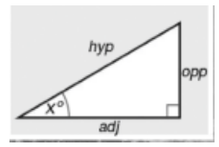
***so that…***

I achieve the minimum score of 8/10 on the quiz

## Unit 4 – transformations

| No. | Question | Answer | EXAMPLE | HIGHER |
|---|---|---|---|---|
| 4.1 | Rotation | Must include:<br>• Centre of rotation<br>• Direction<br>• Degrees | *This shape has been **rotated** from **centre (0,0) anti-clockwise 90°***   | |
| 4.2 | Reflection | Must include:<br>• Line of symmetry | *This shape has been **reflected** in the **line x = -1***   | |
| 4.3 | Translation | Must include:<br>• Vector<br>e.g.<br>$\begin{pmatrix}2\\5\end{pmatrix}$ 2 right, 5 up<br>$\begin{pmatrix}-2\\-5\end{pmatrix}$ 2 left, 5 down | *This shape has been **translated** by **vector** $\begin{pmatrix}7\\0\end{pmatrix}$*   | |
| 4.4 | $\begin{pmatrix}a\\b\end{pmatrix}$ | a right, b up | | |
| 4.5 | $\begin{pmatrix}-a\\-b\end{pmatrix}$ | a left, b down | | |
| 4.6 | Enlargement | Must include<br>• Scale factor<br>• Centre of enlargement | *This shape has been **enlarged** by **scale factor 2 from (2, 1)***   | |
| 4.7 | Fractional scale factor | Makes the image smaller | | |
| 4.8 | Negative enlargement | Inverts the image | | |
| 4.9 | Similar triangles | • Have all angles the same<br>• Enlargement of each other | | |

## Unit 5 and 6 – bearings and trigonometry

| No. | Question | Answer | HIGHER |
|---|---|---|---|
| 6.1 | Always measure bearings | 1. From North<br>2. Clockwise<br>3. Must state 100's 10's and 1's | |
| 6.2 | Pythagoras Theorem   | $a^2 + b^2 = c^2$ | |
| 6.3 | Hypotenuse | Longest side in a right angled triangle (c) | |
| 6.4 | Trigonometric ratios   | 1. $sin\theta = \frac{opp}{hyp}$<br>2. $cos\theta = \frac{adj}{hyp}$<br>3. $tan\theta = \frac{opp}{adj}$ | |
| 6.5 | Sin 30 | $\frac{1}{2}$ | X |
| 6.6 | Sin 45 | $\frac{\sqrt{2}}{2}$ | X |
| 6.7 | Sin 60 | $\frac{\sqrt{3}}{2}$ | X |
| 6.8 | Cos 30 | $\frac{\sqrt{3}}{2}$ | X |
| 6.9 | Cos 45 | $\frac{\sqrt{2}}{2}$ | X |
| 6.10 | Cos 60 | $\frac{1}{2}$ | X |
| 6.11 | Tan 30 | $\frac{\sqrt{3}}{2}$ | X |
| 6.12 | Tan 45 | $1$ | X |
| 6.13 | Tan 60 | $\sqrt{3}$ | X |