SUVA SANGAM COLLEGE

YEAR 12

PHYSICS

WORKSHEET 2

STRAND 1 MECHANICS

NO.	**CONCEPT IN BRIEF: MEASUREMENT** **UNCERTAINTY CALCULATIONS** **Addition and Subtraction** When adding or subtracting two measurements which have uncertainties**, the absolute uncertainties are added together.** Given A = 32.3 ± 0.5 mm and B = 20.4 ± 0.5 mm (i) A + B = [32.3 ± 0.5mm] + [20.4 ± 0.5 mm] = [32.3 + 20.4] $\pm$ [0.5 + 0.5] mm = 52.7 ± 1.0 mm (ii) A - B = [32.3 ± 0.5mm] - [20.4 ± 0.5 mm] = [32.3 - 20.4] $\pm$ [0.5 + 0.5] mm = 11.9 $\pm$ 1.0mm
1	Given $A = 24.12 \pm 0.05\ m \quad and \quad B = 5.36 \pm 0.01m$ (a) **Find A + B** (b) **Find A - B**

	CONCEPT IN BRIEF: MEASUREMENT **Multiplication and Division** When multiplying or dividing two measurements which have uncertainties, **the percentage uncertainties are added together.** 1. The absolute uncertainties is converted to percentage uncertainties 2. These are then added together 3. The final step involves converting the % uncertainty back to absolute uncertainty of the final answer. 4. Rounding off the absolute uncertainty is done so that the least significant digit in the uncertainty will affect the least significant digit in the answer.
2	Given $A = 24.12 \pm 0.05\ m$, $B = 5.36 \pm 0.01m$ and $C = 10.02 \pm 0.01\ m$ (a) **Find $A \times B$** (b) **Find $A \div B \times C$** (c) $Find$ **$A \div B$**