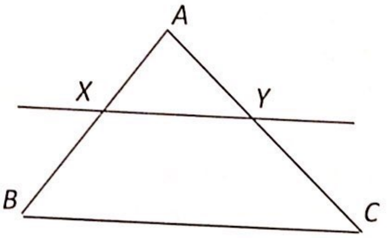
Q6	Model Solution – 25 Marks	Marking Notes
(a)	*Diagram*:  Given: A triangle *ABC* and a line *XY* parallel to *BC* which cuts *AB* in the ratio $s : t$ where $s, t \in \mathbb{N}$. *To Prove*: $[AY] : [YC] = s : t$ *Construction*: Divide [*AB*] into $s + t$ equal parts, *s* of them lying along [*AX*] and *t* of them lying along [*XB*]. Through each point of division draw a line parallel to [*BC*] *Proof*: By a previous theorem the parallel lines cut off segments of equal length along [*AC*]. Therefore [*AC*] is divided into $s + t$ equal parts with *s* of them forming [*AY*] and *t* of them forming [*YC*]. Let *k* be the length of one segment on [*AC*]. $[AY] : [YC] = ks : kt \;\; = s : t$	**Scale 15D (0, 4, 7, 11, 15)** *Low Partial Credit:* Relevant diagram drawn *Mid Partial Credit:* Construction clearly indicated *High Partial Credit:* Proof missing 1 relevant step

(b)	$$\lvert XY\rvert = \sqrt{4^2+3^2} = 5$$ $$\lvert ZC\rvert = 5$$ $$\lvert BZ\rvert = 10\text{cm}$$ **Or** $$\frac{8}{4} \text{ or } \frac{2}{1} = \frac{\lvert BZ\rvert}{5} \rightarrow \lvert BZ\rvert = 10\text{cm}$$ **Or** $$\frac{4}{12} = \frac{5}{5+\lvert BZ\rvert}$$ $$4\lvert BZ\rvert + 20 = 60 \rightarrow \lvert BZ\rvert = 10 \text{ cm}$$ Similarly: $\frac{3}{9} = \frac{5}{5+\lvert BZ\rvert}$	**Scale 10C (0, 3, 7, 10)** *Low Partial Credit:* $\lvert XY\rvert$ or $\lvert BX\rvert$ or $\lvert CY\rvert$ found Pythagoras with some substitution *High Partial Credit:* $\lvert ZC\rvert$ or $\lvert BC\rvert$ found Ratios formulated with $\lvert BZ\rvert$ the sole unknown