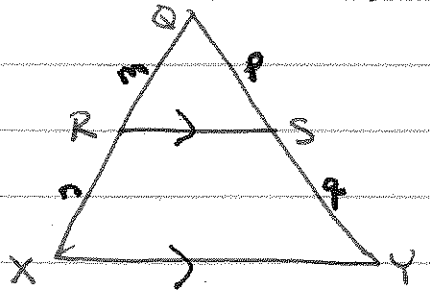
7.5 Proportions in Triangles

① Side-Splitter Theorem

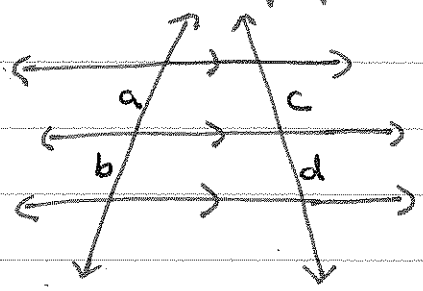
* If a line is // to one side of a Δ and intersects the other two sides, then it divides those sides proportionally



$$\frac{m}{n} = \frac{p}{q}$$

② Corollary

* If 3 // lines intersect 2 transversals, then the segments intercepted on the transversals are proportional

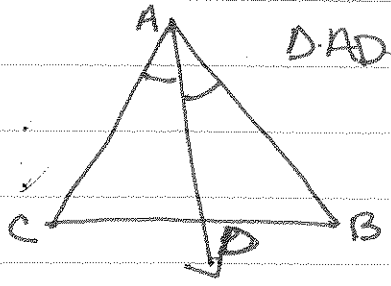


$$\frac{a}{b} = \frac{c}{d}$$

③ Triangle-Angle-Bisector Theorem

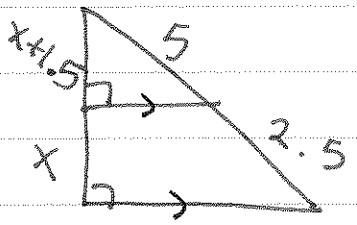
* If a ray bisects an angle of a Δ, then it divides the opposite side into two segments that are proportional to the other two sides of the Δ

$$\frac{AC}{AB} = \frac{CD}{DB}$$



ΔADC ΔADB

Ex. 1



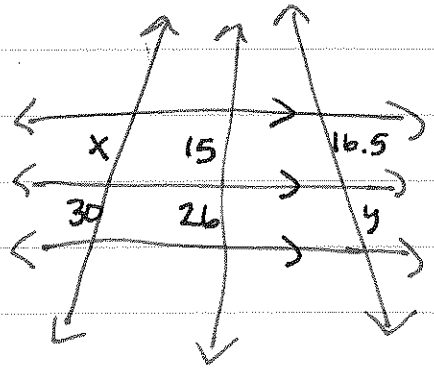
$$\frac{x+1.5}{x} = \frac{5}{2.5}$$

$$2.5x + 3.75 = 5x$$
$$-2.5x \qquad -2.5x$$

$$3.75 = 2.5x$$

$$1.5 = x$$

Ex. 2



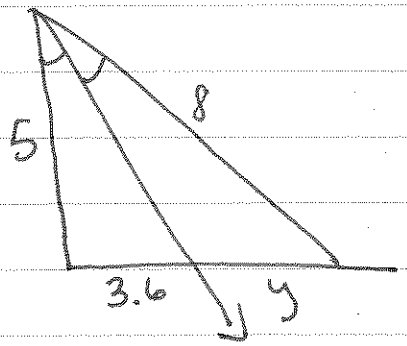
$$\frac{x}{30} = \frac{15}{26}$$

$x = 17.3$

$$\frac{15}{26} = \frac{16.5}{y}$$

$y = 28.6$

Ex. 3



$$\frac{5}{8} = \frac{3.6}{y}$$

$$5y = 28.8$$

$$y = 5.76$$