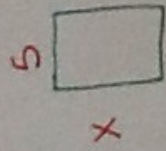


31: Properties of Proportions and Geometric Mean

Prop. #1

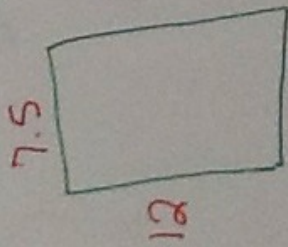
If $\frac{a}{b} = \frac{c}{d}$, then $\frac{a}{c} = \frac{b}{d}$



$$\frac{5}{7.5} = \frac{x}{12}$$

$$60 = 7.5x$$

$$8 = x$$



$$\frac{5}{x} = \frac{7.5}{12}$$

$$60 = 7.5x$$

$$8 = x$$

Prop. #2

If $\frac{a}{b} = \frac{c}{d}$, then $\frac{a+b}{b} = \frac{c+d}{d}$

$$\frac{1+4}{4} = \frac{4+16}{16}$$

$$\frac{5}{4} = \frac{20}{16}$$

In the diagram, $\frac{AB}{AD} = \frac{AC}{AE}$

$$\frac{16}{16+x} = \frac{20}{30}$$

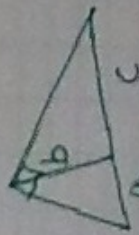
$$480 = 20(16+x)$$

$$480 = 320 + 20x$$

$$-320 \quad -320$$

$$\frac{160}{20} = \frac{20x}{20}$$

$$8 = x$$



Geometric Mean

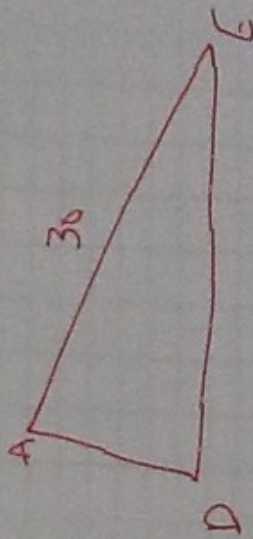
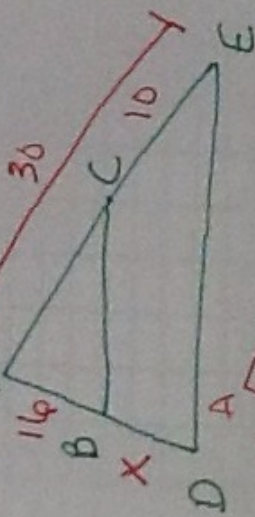
$$\frac{a}{x} = \frac{x}{b}$$

3 and 27

$$\frac{3}{x} = \frac{x}{27}$$

$$\frac{3}{9} = \frac{9}{27}$$

Find \overline{BD} .



4 and 16

$$\frac{4}{x} = \frac{x}{16}$$

$$\sqrt{64} = \sqrt{x^2}$$

$$8 = x$$

$$\frac{4}{8} = \frac{8}{16}$$