$\triangle ABC \sim \triangle ADB \sim \triangle BDC$

$$\frac{AB}{BD} = \frac{BC}{DC} = \frac{AC}{BC}$$

$$\frac{AB}{AD} = \frac{BC}{DB} = \frac{AC}{AB}$$

$$\frac{AD}{BD} = \frac{BD}{DC} = \frac{AB}{BC}$$

Geometric Mean

$$\frac{a}{x} = \frac{x}{b} \quad \text{we say } x \text{ is the}$$

geometric mean of a/b

The altitude from the right angle is the geometric mean of the hypotenuse

$$\frac{AD}{CD} = \frac{CD}{DB}$$
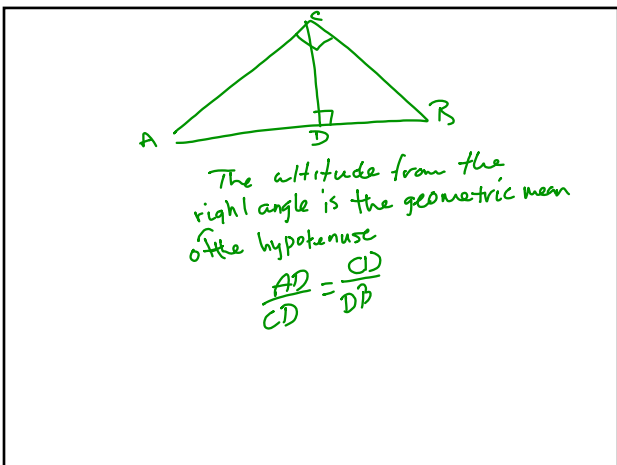
hypotenuse and short leg

$$\frac{AB}{CB} = \frac{CB}{BD}$$

hypotenuse and long leg

$$\frac{AB}{AC} = \frac{AC}{AD}$$

$$\frac{6}{x} = \frac{x}{12}$$

$$x^2 = 72$$

$$x = \sqrt{72} = 8.5 ft$$

$$\frac{18}{h} = \frac{h}{12}$$

$$\sqrt{h^2} = \sqrt{216}$$

$$h \approx 14.7 ft$$

P531-532

2-32 even