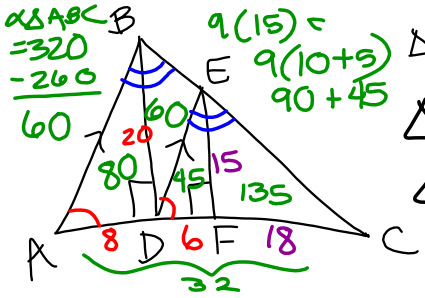


$\alpha\triangle ABC = 320 - 260 = 60$

$9(15) = 9(10+5) = 90+45$

$\triangle BDA \sim \triangle EFD$

$\triangle CDB \sim \triangle CFE$

$\triangle ABC \sim \triangle DEC$

$\frac{EF}{20} = \frac{6}{8}$

$EF = \frac{3}{4} \cdot 20 = 15$

$\frac{FC}{15} = \frac{6+FC}{20}$

$20FC = 15(6+FC)$

$20FC = 90 + 15FC$

$5FC = 90$

$FC = 18$

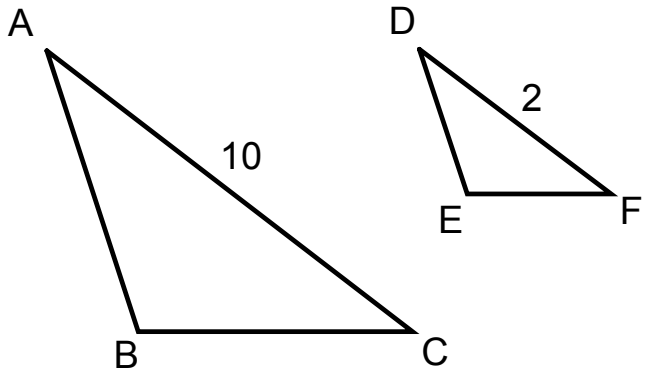
$\frac{AB}{DE} = \frac{8+6+18}{6+18}$

$= \frac{32}{24} = \frac{4}{3}$

$\frac{\alpha\triangle ABD}{\alpha\triangle DEF} = \frac{80}{45} = \frac{16}{9}$

$\frac{BE}{EC} = \frac{1}{3}$

Find the Area of triangle DEF if the area of triangle ABC is 24.



$\frac{\alpha\triangle DEF}{\alpha\triangle ABC} = \frac{(DF)^2}{(AC)^2}$

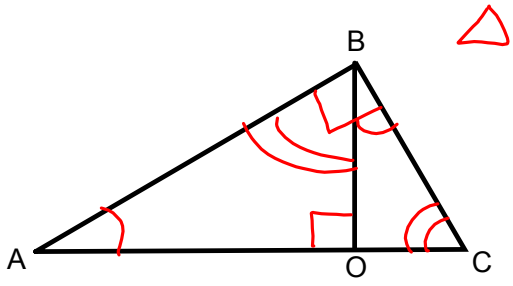
$\frac{\alpha\triangle DEF}{24} = \frac{2^2}{10^2}$

$\alpha\triangle DEF = \frac{4}{100} \cdot 24 = \boxed{\frac{24}{25}}$

Chapter 11 – The Right Triangle

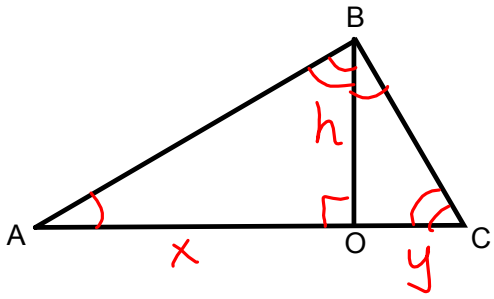
11.1 - Proportions in a Right Triangle

Theorem 49: The altitude to the hypotenuse of a right triangle forms two triangles similar to it and to each other.



$\triangle ABC \sim \triangle AOB \sim \triangle BOC$

Corollary 1 to Theorem 49:
The altitude to the hypotenuse of a right triangle is the geometric mean between the segments into which it divides the hypotenuse.



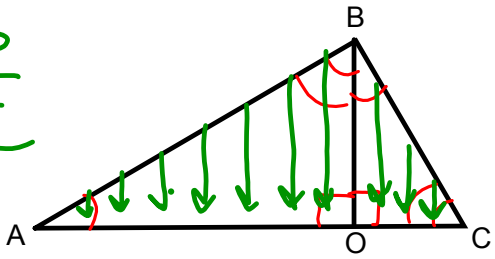
$$\frac{x}{h} = \frac{h}{y}$$

$$h^2 = xy$$

$$h = \sqrt{xy}$$

Corollary 2 to Theorem 49:
Each leg of a right triangle is the geometric mean between the hypotenuse and its projection on the hypotenuse.

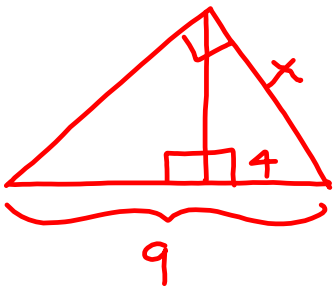
$\frac{AO}{AB} = \frac{AB}{AC}$



$\frac{OC}{BC} = \frac{BC}{AC}$

AO is the projection of AB onto AC
OC is the projection of BC onto AC

p. 431 #16 Find x.



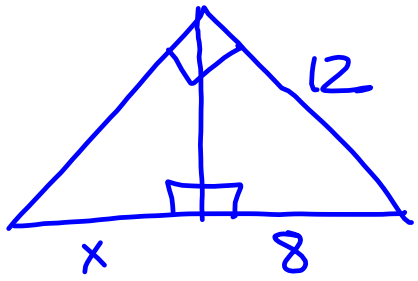
$\frac{x}{4} = \frac{4}{9}$

$\frac{4}{x} = \frac{x}{9}$

$x^2 = 36$

$x = 6$

p. 431 #19 Find x.



$\frac{x}{8+x} = \frac{8+x}{12}$

$\frac{8}{12} = \frac{12}{x+8}$

$8(x+8) = 12^2$

$8x + 64 = 144$

$8x = 80$

$x = 10$

$\frac{5}{h} = \frac{h}{10}$

$h^2 = 50$

$h = \sqrt{50}$

$= 5\sqrt{2}$

HW #2

11.1
- set I p. 431 #15,17,18 (use Theorem 49 & its corollaries for find x)
- set II p. 432 #48-51 (SAT problem)
- set III p. 433 #2-8 (Golden Ratio)

11.2
- set I p. 437 #18-25 (Pythagorean triples)
- set II p. 439 #47-50 (oil well puzzle)
- set III p. 440 #1-3 (Fermat's Last Theorem)

11.3
- set I p. 445 #30-33 (St. Peter's Cathedral & Olympic sailing competition)

11.4
- set I p. 450 #17-28 (tangent ratios in 30-60-90 and 3-4-5 triangles)

11.5
- set I p. 456 #13-22 (sine and cosine ratios in 5-12-13 triangle
- set II p 460 #56-60 (dominos)
- set III p. 460 #1-2 (Proxima Centauri)

11.6
- **set I p. 463 #1-8; 23-30 (slope & distance)**
- **set II p. 466 #52-65 (proofs w/ parallel, perpendicular lines)**

11.7
- **set I p. 471-472 #12-17 (law of sines, law of cosines)**