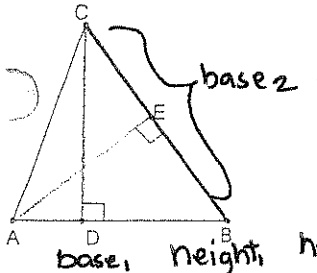
In $\triangle ABC$, $\overline{CD} \perp \overline{AB}$ and $\overline{AE} \perp \overline{BC}$, find the highlighted segment if:

1. AB = 8', CD = 9', AE = 6'




base₁, height₁, height₂

METHOD 1:

$A = \frac{1}{2} b_1 h_1$

$= \frac{1}{2}(8)(9)$

$= 36$

$A = \frac{1}{2} b_2 h_2$

$36 = \frac{1}{2}(b_2)(6)$

$36 = 3b_2$

$12 = b_2$

METHOD 2:

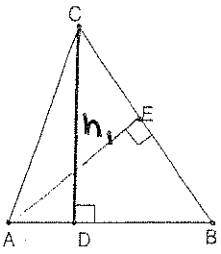
$b_1 \cdot h_1 = b_2 \cdot h_2$

$8 \cdot 9 = b_2 \cdot 6$

$12 = b_2$

12 ft

2. AB = 11', AE = 5', BC = 15'




base₁, height₂, base₂

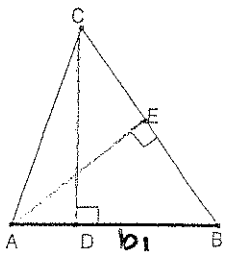
$b_1 h_1 = b_2 h_2$

$11 \cdot h_1 = 15 \cdot 5$

$h_1 = \frac{75}{11}$

$\frac{75}{11}$ ft

3. CD = 14', AE = 10', BC = 21'




$h_1$, $h_2$, $b_2$

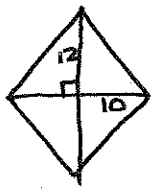
$h_1 \cdot b_2 = h_2 \cdot b_2$

$14 \cdot b_1 = 10 \cdot 21$

$b_1 = 15$

15 ft

4. The diagonals of a rhombus are 20" and 24" Find the area of the rhombus.




$A_{RHOMBUS} = 4 \cdot A_{\text{RIGHT TRIANGLES}}$

$= 4 \cdot \frac{1}{2} b \cdot h$

$= 4 \cdot \frac{1}{2}(10)(12)$

$= 240$

240 in²

5. The length of the hypotenuse $\overline{AC}$ of right $\triangle ABC$ is 30 cm. AB = 18 cm. Find the area of $\triangle ABC$ and the length of BD.

$A_{\triangle ABC} = \frac{1}{2} b_1 h_1$

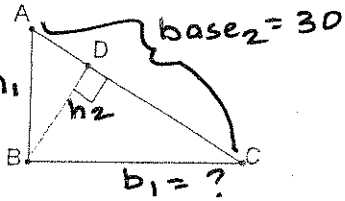
$= \frac{1}{2}(18)(24)$ 18 = $h_1$

$= 216$

$A = \frac{1}{2} b_2 h_2$

$216 = \frac{1}{2}(30) h_2$

$14.4 = h_2$



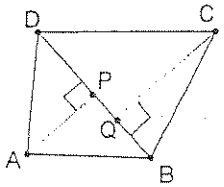

$a^2 + b^2 = c^2$

$18^2 + b^2 = 30^2$

$b = 24$

$A_{\triangle ABC} = 216 \text{ cm}^2$ BD = 14.4 cm

6. If AP = 10 and CQ = 15 find this ratio:

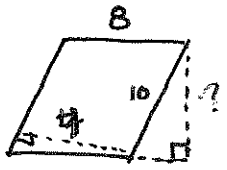



$\frac{area\triangle ABD}{area\triangle BCD}$

$= \frac{\frac{1}{2} \cdot BD \cdot AP}{\frac{1}{2} \cdot BD \cdot CQ}$

$= \frac{AP}{CQ} = \frac{10}{15} = \frac{2}{3}$

7. The lengths of the sides of a parallelogram are 8 in and 10 in. If the length of an altitude to a longer side is 4 in, find the length of an altitude to a shorter side.




$A = b_1 h_1$

$A = b_2 \cdot h_2$

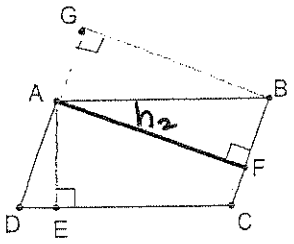
$\longrightarrow b_1 \cdot h_1 = b_2 \cdot h_2$

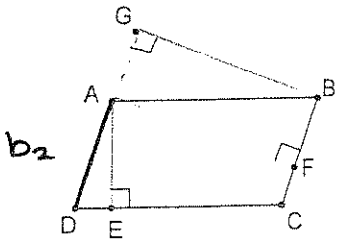
$10 \cdot 4 = 8 \cdot h_2$

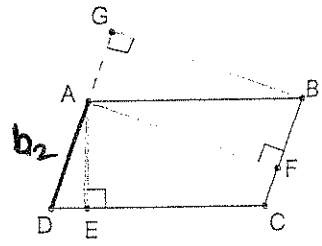
$5 = h_2$

1. 12 ft 2. $6\frac{9}{11}$ ft 3. 15 ft 4. 240 sq in 5. 216 $cm^2$, 14.4 cm 6. 2:3 7. 5 in

Given parallelogram ABCD with $AE \perp DC$, $AF \perp BC$, and $BG \perp DG$. Find the highlighted segment...




8. AE = 7', DC = 12', BC = 14'
($h_1$, $b_1$, $b_2$)

$h_1 \cdot b_1 = h_2 \cdot b_2$
$7 \cdot 12 = h_2 \cdot 14$
$6 = h_2$
6 ft

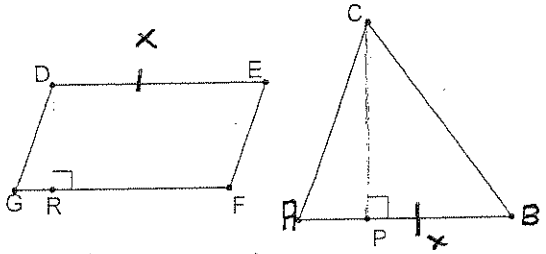
9. AE = 10', AB = 18', GB = 15'
($h_1$, $b_1$, $h_2$)

$h_1 \cdot b_1 = h_2 \cdot b_2$
$10 \cdot 18 = 15 \cdot b_2$
$12 = b_2$
12 ft

10. AF = 6', DC = 14', AE = 8'
($h_2$, $b_1$, $h_1$)

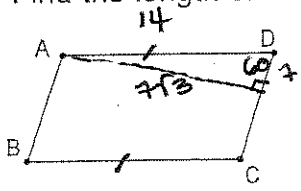
$h_1 \cdot b_1 = h_2 \cdot b_2$
$8 \cdot 14 = 6 \cdot b_2$
$\frac{56}{3} = b_2$
$18\frac{2}{3}$ ft

11. If area of $\triangle ABC$ = area parallelogram DEFG and AB = DE, what is the ratio of CP to DR?



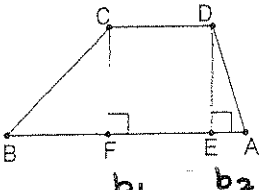

$b_1 h_1 = \frac{1}{2} b_2 h_2$
$x \cdot DR = \frac{1}{2} x \cdot CP$
$DR = \frac{1}{2} CP$
OR $\frac{2\,CP}{1\,DR}$ $\frac{2}{1}$

12. In parallelogram ABCD, AD = 14" and m∠B = 60°
Find the length of the altitude form A to $\overline{CD}$



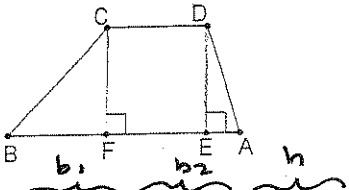

7√3 IN

13 – 15 Find the area of trapezoid ABCD where $\overline{CF} \perp \overline{BA}$ and $\overline{DE} \perp \overline{BA}$ if:



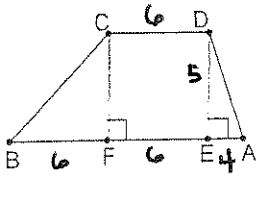

13. AB = 12', DC = 6', DE = 4'
($b_1$, $b_2$, $h$)

$A = \frac{1}{2}(b_1 + b_2) \cdot h$
$= \frac{1}{2}(12 + 6)(4)$
$= 36\ ft^2$




14. AB = 9, DC = 5, CF = 3
($b_1$, $b_2$, $h$)

$A = \frac{1}{2}(b_1 + b_2) \cdot h$
$= \frac{1}{2}(9 + 5)(3)$
$= 21\ ft^2$




15. AE = 4', FB = 6', DC = 6', DE = 5'

$A = \frac{1}{2}(b_1 + b_2) \cdot h$
$= \frac{1}{2}(16 + 6) \cdot 5$
$= 55\ ft^2$

8. 6 ft  9. 12 ft  10. $18\frac{2}{3}$ ft  11. 2:1  12. $7\sqrt{3}$ in  13. 36 sq'  14. 21 ft²  15. 55 ft²