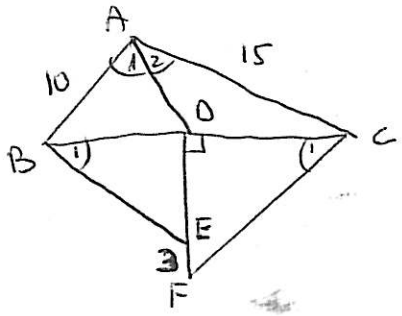
23.



$\frac{AB}{AC} = \frac{BD}{DC} = \frac{10}{15}$ (חוצה זווית AD)

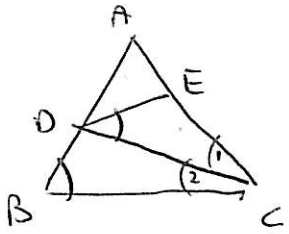
$\triangle BDE \sim \triangle CDF$ (ז.ז.ז)

$\frac{10}{15} = \frac{BD}{DC} = \frac{DE}{FE}$

$\frac{10}{15} = \frac{DE}{DE+3} \Rightarrow 10DE + 30 = 15DE$

$DE = 6$

25.



א. (נתון) $\angle C_1 = \angle C_2$
(נתון) $\angle EDC = \angle B$
$\Rightarrow \triangle DBC \sim \triangle EDC$ (ז.ז)

ב. $(\triangle ABC) \quad 180 = \angle A + \angle B + 2\angle C_1$

$\angle A = 180 - \angle B - 2\angle C_1$

$(\triangle ADE) \quad 180 = \angle ADE + \angle A + \angle AED$

$(\triangle DEC$ - חיצונית) $\angle AED = \angle EDC + \angle C_1 = \angle B + \angle C_1$

$\angle EDC = \angle B$

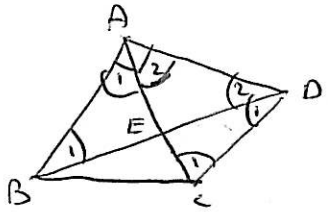
$180 = \angle ADE + 180 - \angle B - 2\angle C_1 + \angle B + \angle C_1$

$\angle ADE = \angle C_1$

$\angle A$ משותפת

$\triangle ADE \sim \triangle ABC$ (ז.ז)

28.



א. (נתון) $\angle A_1 = 60 \rightarrow \angle A_2 = 30$

(זוג זוויות שווות) $\angle B_1 = \angle D_2 = 45$

(נתון) $AB = AC = AD \Rightarrow \triangle ACD$ שווה שוקיים

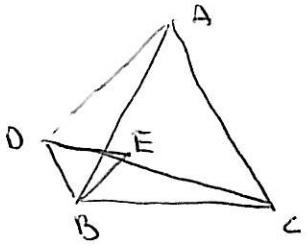
$\angle D = \angle C_1 = \frac{180 - \angle A_2}{2}$

$\triangle ACD \sim \triangle ECD \Leftarrow$ משותפת $\angle C_1$ $\Leftarrow$ $\angle D = \angle C_1 = 75$

$\angle A_2 = \angle D_1$ $\quad \angle D_1 = 75 - \angle D_2 = 30$ (45)

ב. $\frac{AD}{CD} = \frac{CD}{EC} \Rightarrow \frac{a}{CD} = \frac{CD}{b} \rightarrow CD = \sqrt{ab}$

34.



א. (נתון) $AB = BC$
(נתון) $BD = BE$
$\angle EBC = \angle ABC - \angle ABE = 60 - \angle ABE$
$\angle DBA = \angle DBE - \angle ABE = 60 - \angle ABE$
$\triangle BDA \cong \triangle BEC$ (ז.ז.ז)

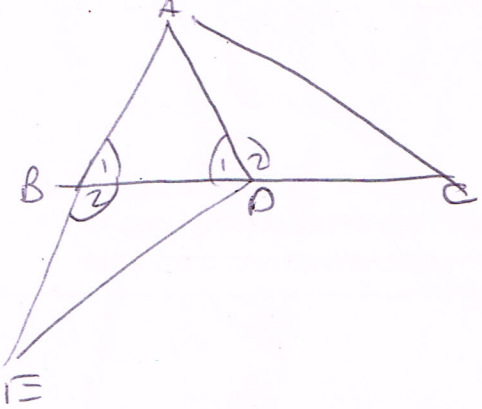
$\angle BDA = \angle BEC = 180 - \angle BED = 180 - 60 = 120$

$\angle ADC = \angle BDA - \angle BDE = 120 - 60 = 60$

$\angle BED = 60 = \angle ADC \Rightarrow DA \parallel BE$ (זוויות מתחלפות)

ב. $\angle BDA + \angle C = 120 + 60 = 180 \Rightarrow$ אפשר לחסום את $ADBC$ בתוך מעגל.

27
(290)



א. $\sphericalangle DAC = \sphericalangle BAD = \alpha$ נתון

$\sphericalangle B_1 = \sphericalangle D_1 = \frac{180-\alpha}{2} = 90 - \frac{\alpha}{2}$

$\sphericalangle D_2 = 180 - \sphericalangle D_1 = 90 + \frac{\alpha}{2}$

$\Rightarrow \sphericalangle C = 180 - \sphericalangle D_2 - \sphericalangle DAC = 90 - 1\frac{1}{2}\alpha$

$AD = DE$ נתון

$\sphericalangle E = \sphericalangle BAD = \alpha$

$\sphericalangle B_2 = 180 - \sphericalangle B_1 = 90 + \frac{\alpha}{2}$

$\Downarrow$

$\triangle ADC \sim \triangle BDE$ (ז.ז)

ב. מהדמיון נקבל את היחס הנתון:

$$\frac{AC}{ED} = \frac{AD}{BD}$$

$$\frac{9}{6} = \frac{6}{BD} \rightarrow \boxed{BD = 4}$$

נמצא את אורך הצלע BC במשולש ABC:

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

$$\frac{6}{9} = \frac{4}{DC} \rightarrow \boxed{DC = 6}$$

מהדמיון נקבל כי

$$\frac{AC}{ED} = \frac{DC}{BE}$$

$$\frac{9}{6} = \frac{6}{BE} \rightarrow \boxed{BE = 4}$$

$$AE = AB + BE = 6 + 4 = 10$$