	Kaflapróf 1 **Kafli 1 – 3**	**STÆF2RH05** Haustönn 2018
Nafn: LAUSN		Einkunn:

1. (15%) Línan n er samsíða AB. Finndu stærð hornanna:

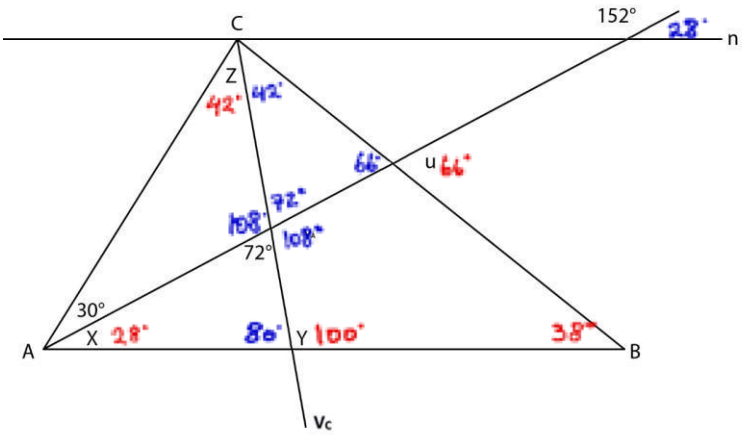
B = 38°

U = 66°

X = 28°

Y = 100°

Z = 42°

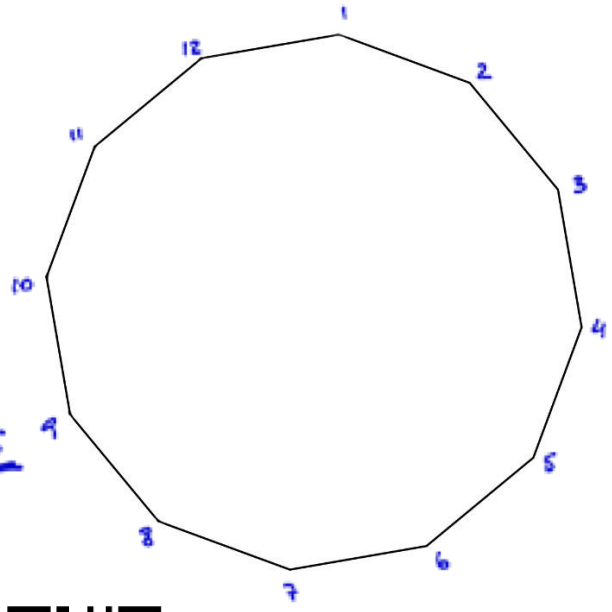


2. (10%) Hér til hliðar er reglulegur marghyrningur.

a. **Hvað eru horn hans mörg?**

b. **hver er hornasumma hans?**

c. **hvað er hvert horn hans stórt?**



Fjöldi horna: 12

Hornasumma: $(12-2)\cdot 180^\circ = 1800^\circ$

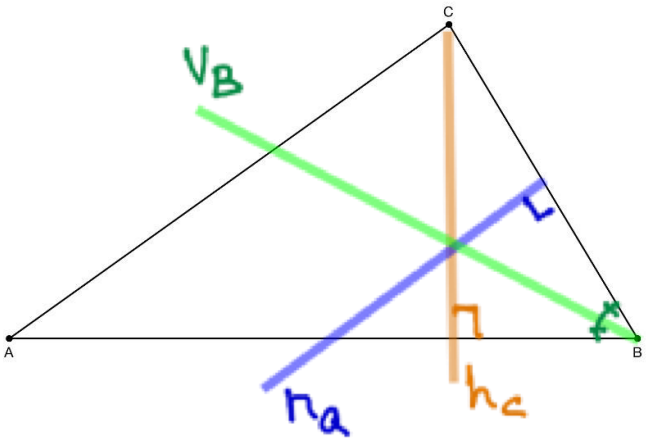
Stærð hvers horns: $\frac{1800^\circ}{12} = 150^\circ$

3. **(15%) Hér er þríhyrningurinn ABC. Teiknaðu eftirfarandi línur inn á þríhyrninginn og merktu þær.**

a) **Hæðina á c (h_c).**

b) **Miðþveril á a (n_a).**

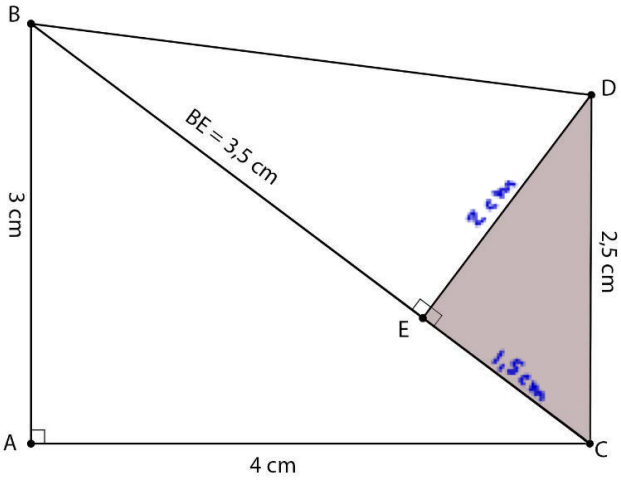
c) **Helmingunarlínu hornsins B (V_B).**



4. **(20%) Hér til hliðar eru þrír rétthyrndir þríhyrningar. Hliðin AB = 3 cm, AC = 4 cm, CD = 2,5 cm og BE = 3,5 cm. Notaðu reglu Pýþagóras til að finna**

a) Hliðina CE. 1,5 cm

b) Hliðina DE. 2 cm



CE

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

$3^2 + 4^2 = c^2$

$9 + 16 = c^2$

$\sqrt{25} = \sqrt{c^2}$

$5 = c$

$CE = 5 - 3{,}5$

$CE = 1{,}5$ cm

DE

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

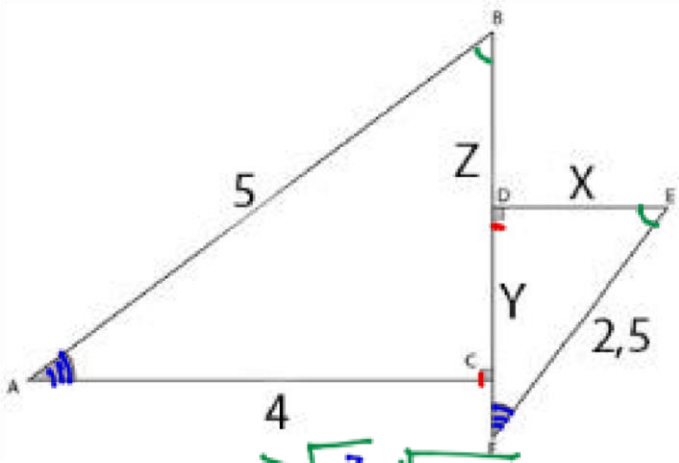
$1{,}5^2 + b^2 = 2{,}5^2$

$b^2 = 6{,}25 - 2{,}25$

$\sqrt{b^2} = \sqrt{4}$

$b = 2$ cm

5. **(10%) Þríhyrningarnir ABC og DEF eru einshyrndir. Hornin A og F eru jafnstór. X = DE, Y = DF og Z = BC. Finndu:**



a) **X:** 1,5

b) **Y:** 2

FINNA Y:

$\frac{Y}{4} = \frac{2,5}{5}$

$\frac{5Y}{5} = \frac{4 \cdot 2,5}{5}$

$Y = 2$

FINNA X:

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

$2^2 + b^2 = 2,5^2$

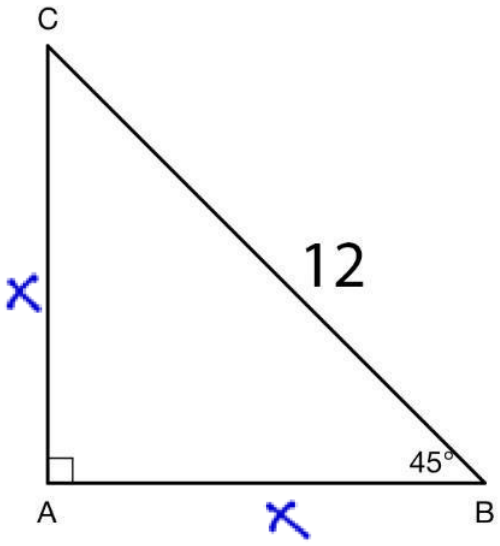
$b^2 = 6,25 - 4$

$\sqrt{b^2} = \sqrt{2,25}$

$b = X = 1,5$

6. **(5%) Þríhyrningur er (45°, 45°, 90°). Langhlið hans er 12.**

Sýndu með útreikningum að lengd skammhliðar b = $6\sqrt{2}$**.**



$x^2 + x^2 = 12^2$

$\frac{2x^2}{2} = \frac{144}{2}$

$\sqrt{x^2} = \sqrt{72}$

$x = b = \sqrt{72} = \sqrt{36 \cdot 2} = 6\sqrt{2}$

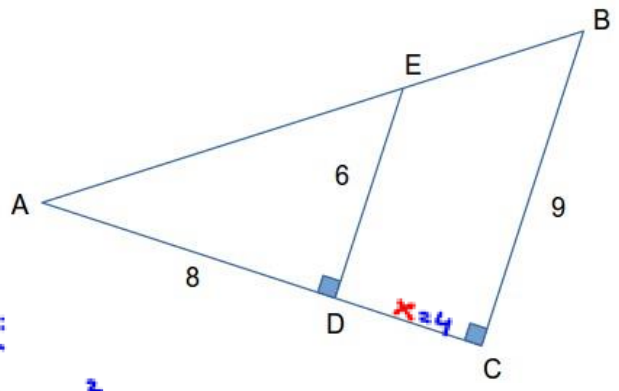
EÐA:

$c = a\sqrt{2}$

$\frac{12}{\sqrt{2}} = \frac{a\sqrt{2}}{\sqrt{2}}$

$\frac{12}{\sqrt{2}} = a = b \Rightarrow b = \frac{12}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{12\sqrt{2}}{2} = 6\sqrt{2}$

7. **(10%) Þríhyrningarnir eru einslaga.**
BC = 9, DE = 6 og AD = 8.
Reiknaðu lengdina á AB og DC.



AB: 15

DC: 4

DC = X

$\frac{(8+X)}{8} = \frac{9}{6}$

$6(8+X) = 8 \cdot 9$

$48 + 6X = 72$

$6X = 72 - 48$

$\frac{6X}{6} = \frac{24}{6}$

$X = DC = 4$

FINNA AB:

AB = c

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

$9^2 + 12^2 = c^2$

$81 + 144 = c^2$

$\sqrt{225} = \sqrt{c^2}$

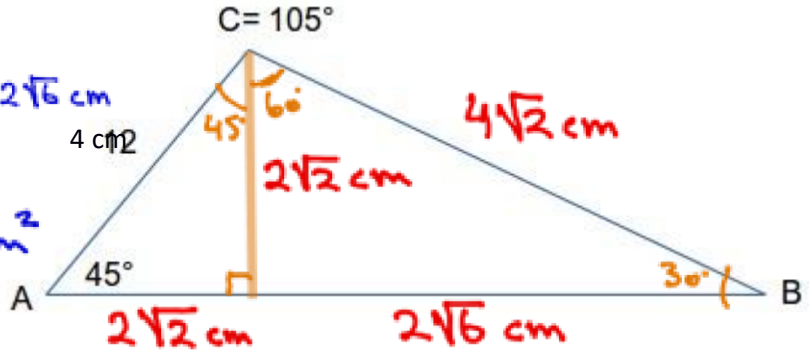
$15 = c = AB$

8. **(15%) Í þríhyrningnum ABC er A= 45°, C = 105° og b = 4 cm.**
Finndu með <u>stærðfræðilegri nákvæmni</u> hliðina a, hliðina c
og flatarmál þríhyrningsins.

a = $\frac{8}{\sqrt{2}} = 4\sqrt{2}$ cm

c = $\frac{4}{\sqrt{2}} + \frac{4}{\sqrt{2}}\sqrt{3} = 2\sqrt{2} + 2\sqrt{6}$ cm

flatarmál = $4 + 4\sqrt{3}$ cm²



$F = \frac{g \cdot h}{2} = \frac{(2\sqrt{2} + 2\sqrt{6}) \cdot 2\sqrt{2}}{2} = (2\sqrt{2} + 2\sqrt{6}) \cdot \sqrt{2} = 4 + 4\sqrt{3}$ cm²

ÚTSKÝRINGAR: $\frac{4}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{4\sqrt{2}}{2} = 2\sqrt{2}$; $\frac{4\sqrt{3}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{4\sqrt{6}}{2} = 2\sqrt{6}$; $\frac{(\,)\frac{4}{\sqrt{2}} \cdot \sqrt{2}}{2} = \frac{(\,)2\sqrt{2}}{2} = (\,)\sqrt{2}$