

Nafn: LAUGN

Einkunn: _____

VMA haust 2018 STÆF2RH05 kaflapróf 2 úr köflum 4 og 5

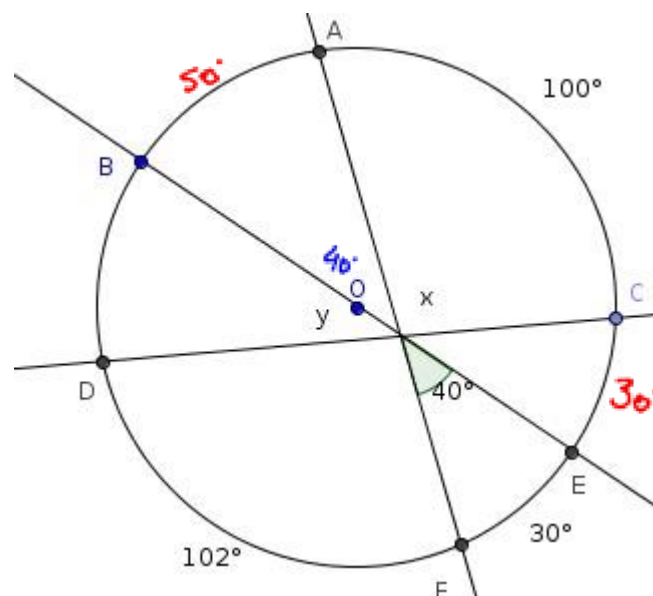
1. (20%) Reiknaðu út stærð boganna AB, CD og stærð hornanna x og y. Miðpunktur hringsins er O. Boginn AC er 100° , boginn EF er 30° og boginn DF er 102° .

Hornið x = 101°

Hornið y = 39°

Boginn AB = 50°

Boginn CE = 30°



FINNA $\widehat{AB}$:

$$2 \cdot \frac{(\widehat{AB} + 30^\circ)}{2} = 40^\circ \cdot 2$$

$$\widehat{AB} + 30^\circ = 80^\circ$$

$$\widehat{AB} = 80^\circ - 30^\circ$$

$$\widehat{AB} = 50^\circ$$

FINNA $\widehat{CE}$:

$$\widehat{AB} + \widehat{AC} + \widehat{CE} = 180^\circ$$

$$50^\circ + 100^\circ + \widehat{CE} = 180^\circ$$

$$\widehat{CE} = 180^\circ - 50^\circ - 100^\circ$$

$$\widehat{CE} = 30^\circ$$

FINNA x:

$$\frac{100^\circ + 102^\circ}{2} = x$$

$$\frac{202}{2} = x$$

$$101^\circ = x$$

FINNA y:

$$y + 40^\circ + x = 180^\circ$$

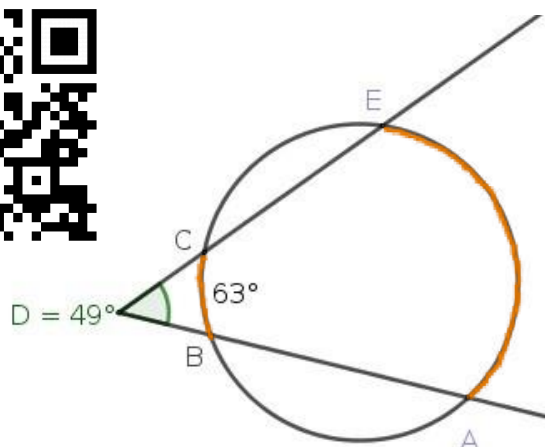
$$y + 40^\circ + 101^\circ = 180^\circ$$

$$y = 180^\circ - 40^\circ - 101^\circ$$

$$y = 39^\circ$$



2. (5%) Reiknaðu út stærð bogans AE.



Boginn AE = 161°

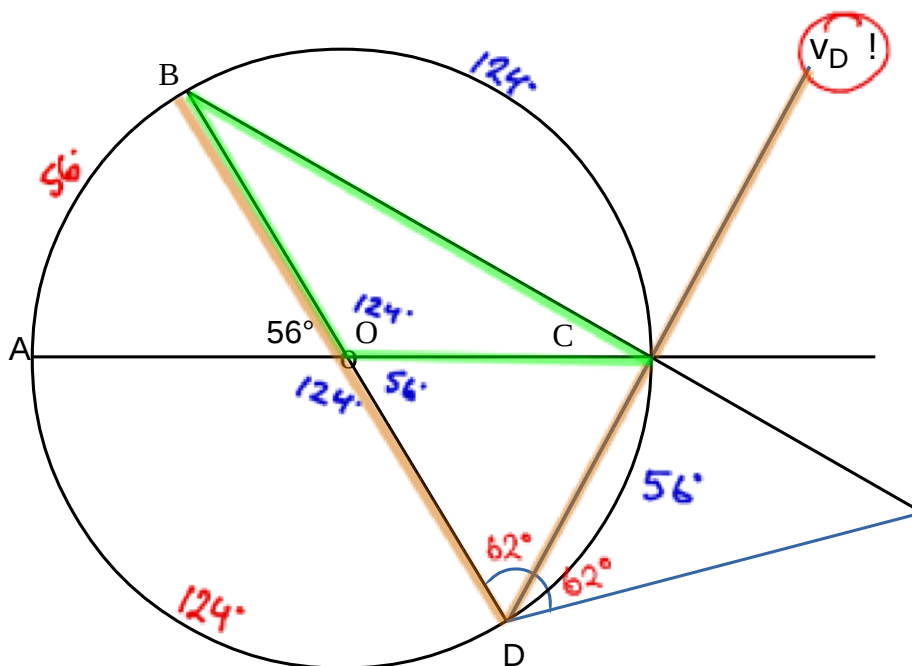
$$2 \cdot \frac{(\widehat{EA} - 63^\circ)}{2} = 49^\circ \cdot 2$$

$$\widehat{EA} - 63^\circ = 98^\circ$$

$$\widehat{EA} = 98^\circ + 63^\circ$$

$$\widehat{EA} = 161^\circ$$

3. (20%) Finndu stærð þeirra horna og boga sem beðið er um.
Punkturinn O er miðja hringsins.



Boginn AB = 56

Boginn AD = 124°

Horní D = 124°

Horníř C = 28.

FINNA C:

$$180^\circ - 124 = 56^\circ$$

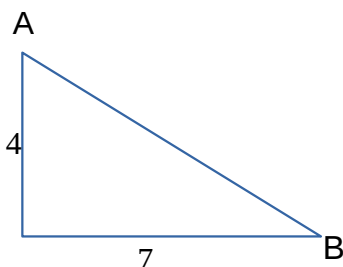
$$C = \frac{56}{2}$$

$\angle = 28^\circ$

Finna D:

$$2 \times 62^\circ = \underline{\underline{124^\circ}}$$

4. (5%) Finndu stærð hornanna A og B á rétthyrnda þríhyrningnum sem vantar á myndinni hér að neðan. Sýndu formúlu.



$$\cos(A) = \frac{A}{L} \quad \sin(A) = \frac{M}{L} \quad \tan(A) = \frac{M}{A}$$

FINNA A:

$$\tan(A)^{-1} = \frac{7}{4}$$

A = 60,26°

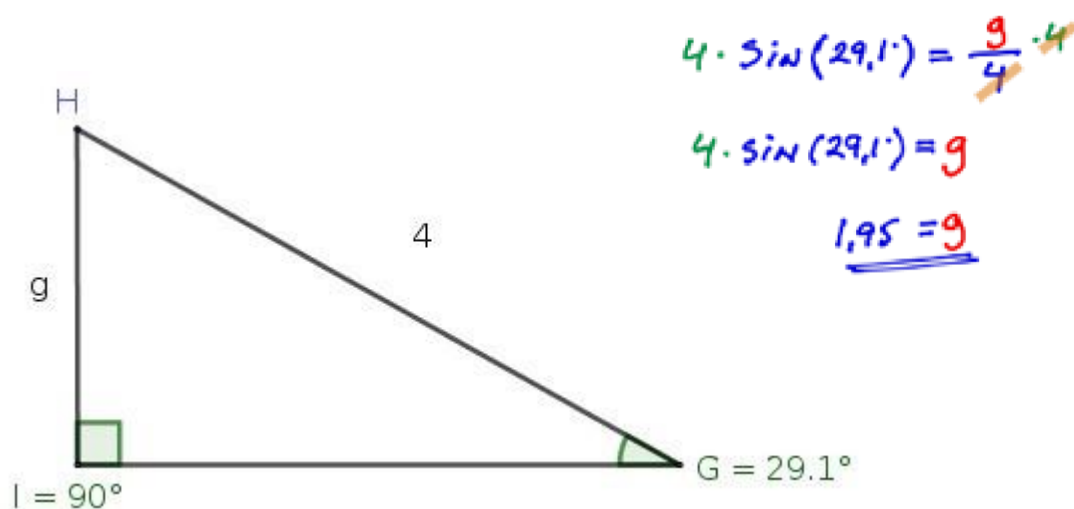
Finna B:

$$\tan(\theta)^{-1} = \frac{4}{7}$$

$$B = 29,75^\circ$$



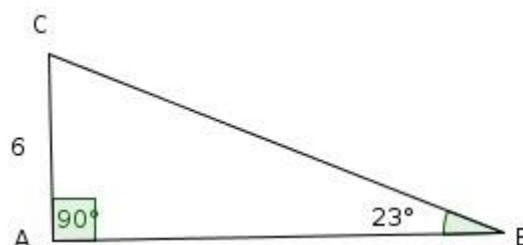
5. (5%) Reiknaðu út lengd hliðar g. Hliðin i er 4 og hornið G er $29,1^\circ$. Sýndu formúlu.



6. (10%) Reiknaðu út lengdina á hlið a og hlið c. Hornið B er 23° og hliðin b er 6.

Hlið a = 15,36

Hlið c = 14,14



$$\cos(A) = \frac{A}{L} \quad \sin(A) = \frac{M}{L} \quad \tan(A) = \frac{M}{A}$$

Finna Hlið a:

$$a \cdot \sin(23^\circ) = \frac{6 \cdot a}{a}$$

$$\frac{a \cdot \sin(23^\circ)}{\sin(23^\circ)} = \frac{6}{\sin(23^\circ)}$$

$$a = \frac{6}{\sin(23^\circ)}$$

$$\underline{\underline{a = 15,36}}$$

Finna Hlið c:

$$c \cdot \tan(23^\circ) = \frac{6 \cdot c}{c}$$

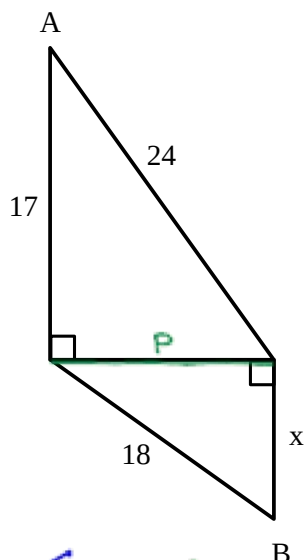
$$\frac{c \cdot \tan(23^\circ)}{\tan(23^\circ)} = \frac{6}{\tan(23^\circ)}$$

$$c = \frac{6}{\tan(23^\circ)}$$

$$\underline{\underline{c = 14,14}}$$



7. (15%)



Reiknaðu:

a) Hornið A: 44,9°

b) Hliðina x: 6,08

c) Hornið B: 70,26°

Finna A:

$$\cos(A)^{-1} = \frac{17}{24}$$

$$A = 44,9^\circ$$

Finna P:

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

$$p^2 + 17^2 = 24^2$$

$$p^2 = 576 - 289$$

$$\sqrt{p^2} = \sqrt{287}$$

$$p = 16,94$$

Finna X:

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

$$x^2 + 16,94^2 = 18^2$$

$$x^2 = 324 - 287$$

$$\sqrt{x^2} = \sqrt{37}$$

$$x = 6,08$$

Finna B:

$$\cos(B)^{-1} = \frac{6,08}{18}$$

$$B = 70,26^\circ$$

8. (20%) Þríhyrningurinn ABC er ekki rétthyrndur.

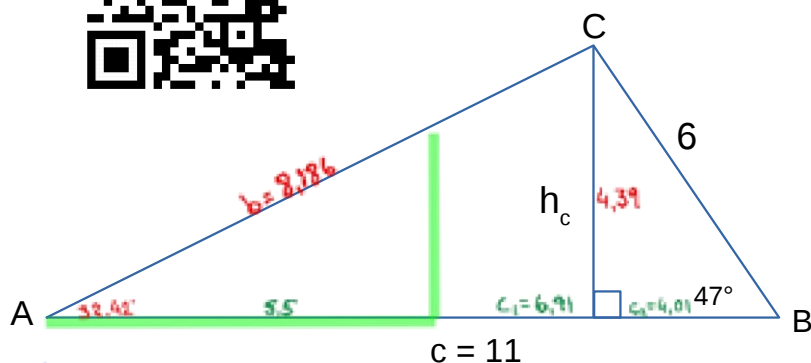
Hornið B = 47°, hliðin a = 6 og hliðin c = 11.

Reiknaðu: $h_c =$ 4,39

hornið A = 32,42°

hliðina b = 8,186

hliðina $n_c =$ 3,49



c = 11

Finna h_c :

$$6 \cdot \sin(47^\circ) = \frac{h_c}{6}$$

$$6 \cdot \sin(47^\circ) = h_c$$

$$4,39 = h_c$$

Finna c_2 :

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

$$c_2^2 + 4,39^2 = 6^2$$

$$c_2^2 = 36 - 19,26$$

$$\sqrt{c_2^2} = \sqrt{16,74}$$

$$c_2 = 4,09$$

Finna c_1 :

$$C = c_1 + c_2$$

$$11 = c_1 + 4,09$$

$$11 - 4,09 = c_1$$

$$6,91 = c_1$$

Finna b:

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

$$4,39^2 + 6,91^2 = b^2$$

$$19,27 + 47,75 = b^2$$

$$\sqrt{67,02} = b$$

$$8,186 = b$$

Finna A:

$$\cos(A)^{-1} = \frac{6,91}{8,186}$$

$$A = 32,42^\circ$$

Finna n_c :

$$5,5 \tan(32,42^\circ) = \frac{n_c \cdot 5,5}{5,5}$$

$$5,5 \cdot \tan(32,42^\circ) = n_c$$

$$3,49 = n_c$$