

TEMA 1 : Trigonometria

Solucions

1.

a) 0 rad

b) $\frac{\pi}{4}$ rad

c) $\frac{\pi}{2}$ rad

d) $\frac{2\pi}{3}$ rad

e) $\frac{7\pi}{6}$ rad

f) $\frac{5\pi}{4}$ rad

g) $\frac{5\pi}{3}$ rad

h) $\frac{11\pi}{6}$ rad

2.

a) 135°

b) 300°

c) 120°

d) 180°

e) 360°

g) 270°

h) 162°

i) 240°

3. $1.7 \text{ rad} = (1.7 \cdot 180)^\circ$, per tant és més gran que un angle recte 90°

4.

a) Fals, $-1 \leq \cos \alpha \leq 1$

b) Fals, també pot ser igual a 1 en el cas de 90°

c) Cert en el cas de 0°

d) Fals, $-1 \leq \sin \alpha \leq 1$

e) Cert

f) Fals, $\text{tg } 60^\circ = \sqrt{3} > 1$

g) Cert, $\text{tg } 45^\circ = 1$

h) Fals, $\text{tg } 135^\circ = -1$

5.

a) $\sin a = \frac{-3}{5}$ $\text{tga} = \frac{-3}{4}$ $\sec a = \frac{5}{4}$ $\cos eca = \frac{-5}{3}$ $\cot a = \frac{-4}{3}$

b) $\cos a = \frac{-4}{5}$ $\text{tga} = \frac{-3}{4}$ $\sec a = \frac{-5}{4}$ $\cos eca = \frac{5}{3}$ $\cot a = \frac{-4}{3}$

c) $\sin a = \frac{-3}{5}$ $\cos a = \frac{-4}{5}$ $\sec a = \frac{-5}{4}$ $\cos eca = \frac{-5}{3}$ $\cot a = \frac{-5}{3}$

d) $\sin a = \frac{\sqrt{5}}{10}$ $\cos a = \frac{-\sqrt{5}}{5}$ $\text{tga} = \frac{-1}{2}$ $\sec a = \frac{-10}{\sqrt{5}}$ $\cos eca = 2\sqrt{5}$

6.

a) $45^\circ + 180^\circ \cdot k$; $135^\circ + 180^\circ \cdot k$ $k = 0, 1, 3, 4, \dots$

b) oposats α i $-\alpha$

c) no sempre hi hauran dues solucions (1r i 3r quadrant) (2n i 4t quadrant)

d) si, sinus = cosecant 90° i 270° , en el cas de cosinus = secant 0° i 180° , i en el cas de tangent = cotangent en els angles 45° , 135° , 225° i 315° .

7.

$$\text{a) } \sin a = \frac{3}{5}$$

$$\text{b) } \cos a = \frac{4}{5}$$

$$\text{c) } \sin (90^\circ - a) = \cos a = \frac{4}{5}$$

$$\text{d) } \cos (90^\circ - a) = \sin a = \frac{3}{5}$$

$$\text{e) } \cos (180^\circ - a) = -\cos a = -\frac{4}{5}$$

$$\text{f) } \operatorname{tg} (180^\circ + a) = \operatorname{tg} a = \frac{3}{4}$$

$$\text{g) } \sin (270^\circ - a) = -\cos a = -\frac{4}{5}$$

$$\text{h) } \operatorname{tg} (270^\circ - a) = \operatorname{cot} a = \frac{4}{3}$$

$$\text{i) } \cos (360^\circ - a) = \cos a = \frac{4}{5}$$

8.

$$\text{a) } \operatorname{tg} 150 = -\operatorname{tg} 30 = \frac{-\sqrt{3}}{3}$$

$$\text{b) } \sin 300^\circ = -\sin 60^\circ = \frac{-\sqrt{3}}{2}$$

$$\text{c) } \cos 1320 = \cos 240^\circ = -\cos 60^\circ = \frac{-1}{2}$$

$$9. b = 15\text{m}, B = 36,87^\circ, C = 53,13^\circ$$

$$10. \text{costat} = 15, 625 \text{ m}, h = 11,97\text{m} \text{ àrea} = 119,7 \text{ m}^2$$

$$11. \text{altura} = 65,44 \text{ cm}$$

$$12. \text{a) doble : } 19,3^\circ \quad \text{b) triple: } 13,13^\circ$$

$$13. a = 2,91 \text{ km}; \quad b = 3,18 \text{ km}$$

$$14. 15,8 \text{ m}$$

$$15. 13,08 \text{ km}$$

$$16. 1765,77 \text{ m}$$

$$17. 264,6 \text{ km no podran posar-se en contacte}$$

$$18. a = 31,36\text{m}; \quad A = 70^\circ$$

$$19. \sin 15^\circ = \frac{\sqrt{2}}{4}(\sqrt{3}-1); \quad \cos 15^\circ = \frac{\sqrt{2}}{4}(\sqrt{3}+1)$$

20.

$$21. \text{a) } \tan x \quad \text{b) } 4\cos a \quad \text{c) } -\tan a$$

$$22. \cos x \cdot \cos y \cdot \cos z - \cos x \cdot \sin y \cdot \sin z - \sin x \cdot \sin y \cdot \cos z - \sin x \cdot \cos y \cdot \sin z$$

23.

$$a) \begin{cases} x_1 = 120^\circ + 360^\circ \cdot k \\ x_2 = 240^\circ + 360^\circ \cdot k \end{cases} \quad k = 0, 1, 2, \dots$$

$$b) \begin{cases} x_1 = 90^\circ + 180^\circ \cdot k \\ x_2 = 0^\circ + 360^\circ \cdot k \end{cases} \quad k = 0, 1, 2, \dots$$

$$c) \begin{cases} x_1 = 52^\circ 31' 58'' + 380^\circ \cdot k \\ x_2 = 127^\circ 28' 2'' + 360^\circ \cdot k \end{cases} \quad k = 0, 1, 2, \dots$$

$$d) x_1 = 90^\circ + 180^\circ \cdot k \quad k = 0, 1, 2, \dots$$

$$e) \begin{cases} x_1 = 60 + 360 \cdot k \\ x_2 = 180 + 360 \cdot k \\ x_3 = 300 + 360 \cdot k \end{cases} \quad k = 0, 1, 2, \dots$$

$$f) \begin{cases} x_1 = 90 + 360 \cdot k \\ x_2 = 210 + 360 \cdot k \\ x_3 = 330 + 360 \cdot k \end{cases} \quad k = 0, 1, 2, \dots$$

$$g) \begin{cases} x_1 = 60^\circ + 360^\circ \cdot k \\ x_2 = 300^\circ + 360^\circ \cdot k \end{cases} \quad k = 0, 1, 2, \dots$$

$$h) x_1 = 90^\circ + 180^\circ \cdot k \quad k = 0, 1, 2, \dots$$

$$i) \begin{cases} x_1 = 56^\circ 18' 35'' + 180^\circ \cdot k \\ x_2 = 135^\circ + 180^\circ \cdot k \end{cases} \quad k = 0, 1, 2, \dots$$

$$j) \begin{cases} x_1 = 30^\circ + 360^\circ \cdot k \\ x_2 = 150^\circ + 360^\circ \cdot k \\ x_2 = 210^\circ + 360^\circ \cdot k \\ x_2 = 330^\circ + 360^\circ \cdot k \end{cases} \quad k = 0, 1, 2, \dots$$

$$k) \begin{cases} x_1 = 60^\circ + 180^\circ \cdot k \\ x_2 = 120^\circ + 180^\circ \cdot k \end{cases} \quad k = 0, 1, 2, \dots$$

$$l) x = \begin{cases} x_1 = 30^\circ + 360^\circ \cdot k \\ x_2 = 150^\circ + 360^\circ \cdot k \end{cases} \quad k = 0, 1, 2, \dots$$

$$\text{m) } \begin{cases} x_1 = 15^\circ + 180^\circ \cdot k \\ x_2 = 75^\circ + 180^\circ \cdot k \end{cases} \quad k = 0, 1, 2, \dots$$