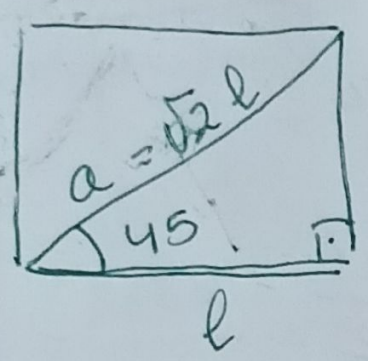
Prueba corta MATEMÁTICAS 1 BACH A- **UNIDAD 5** - 19/02/2026

Nombre: _____

- **No se valorarán ejercicios que sólo presenten el resultado final sin realizar el desarrollo.**

1. (3 puntos) Calcular las razones trigonométricas del ángulo de 45°.



Th. pitagoras

$a^2 = \ell^2 + \ell^2$

$a = \sqrt{2\ell^2}$

$a = \sqrt{2} \cdot \ell$

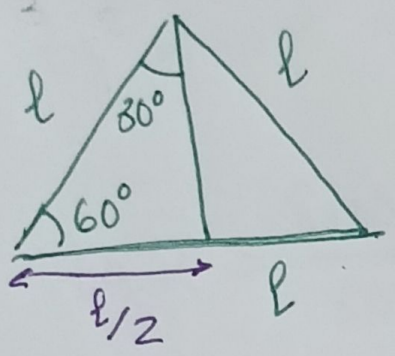
$\operatorname{sen} 45° = \frac{\text{Cat op}}{\text{hip}} = \frac{\ell}{\sqrt{2}\ell} = \frac{\sqrt{2}}{2} \Rightarrow \operatorname{cosec} 45° = \frac{1}{\operatorname{sen} 45°} = \sqrt{2}$

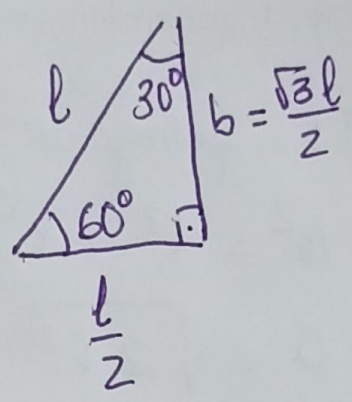
$\cos 45° = \frac{\text{Cat cont}}{\text{hip}} = \frac{\ell}{\sqrt{2}\ell} = \frac{\sqrt{2}}{2} \Rightarrow \sec 45 = \frac{1}{\cos 45°} = \sqrt{2}$

$\operatorname{tg} 45° = \frac{\text{Cat op}}{\text{Cat cont}} = \frac{\ell}{\ell} = 1 \Rightarrow \operatorname{cotg} 45° = \frac{1}{\operatorname{tg} 45°} = 1$

2. (3 puntos) Calcular las razones trigonométricas del ángulo de 30° y 60°.

TRIANGULO EQUILATERO





$$\ell^2 = \frac{\ell^2}{4} + b^2$$

$$\frac{3\ell^2}{4} = b^2$$

$$b = \frac{\sqrt{3}\,\ell}{2}$$

$$\operatorname{sen} 30° = \frac{\text{cat op}}{\text{hip}} = \frac{\ell/2}{\ell} = \frac{1}{2} \Rightarrow \operatorname{cosec} 30° = \frac{1}{\operatorname{sen} 30°} = 2$$

$$\cos 30° = \frac{\text{cat cont}}{\text{hip}} = \frac{\frac{\sqrt{3}\ell}{2}}{\ell} = \frac{\sqrt{3}}{2} \Rightarrow \sec 30° = \frac{1}{\cos 30°} = \frac{2\sqrt{3}}{3}$$

$$\operatorname{tg} 30° = \frac{\text{Cat op}}{\text{Cat cont}} = \frac{\ell/2}{\sqrt{3}\,\ell/2} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3} \Rightarrow \operatorname{cotg} 30° = \frac{1}{\operatorname{tg} 30°} = \sqrt{3}$$

$$\operatorname{sen} 60° = \frac{\text{Cat op}}{\text{hip}} = \frac{\sqrt{3}\ell/2}{\ell} = \frac{\sqrt{3}}{2} \Rightarrow \operatorname{cosec} 60° = \frac{1}{\operatorname{sen} 60°} = \frac{2\sqrt{3}}{3}$$

$$\cos 60° = \frac{\text{cat cont}}{\text{hip}} = \frac{\ell/2}{\ell} = \frac{1}{2} \Rightarrow \sec 60° = \frac{1}{\cos 60°} = 2$$

$$\operatorname{tg} 60° = \frac{\text{Cat op}}{\text{cat cont}} = \frac{\sqrt{3}\,\ell/2}{\ell/2} = \sqrt{3} \Rightarrow \operatorname{cotg} 60° = \frac{\sqrt{3}}{3}$$

3. (4 puntos) Calcula las restantes razones trigonométricas en los siguientes casos:

a) $sen\alpha = \frac{2}{3}$ α es un ángulo del primer cuadrante. $\begin{cases} \text{sen}\,\alpha > 0 \\ \cos\alpha \geq 0 \end{cases}$ $tg\alpha > 0$

$$\text{sen}^2\alpha + \cos^2\alpha = 1$$

$$\cos\alpha = \pm\sqrt{1 - \text{sen}^2\alpha}$$

$$\cos\alpha = +\sqrt{\frac{5}{9}} \Rightarrow \cos\alpha = \frac{\sqrt{5}}{3}$$

$$tg\,\alpha = \frac{\text{sen}\,\alpha}{\cos\alpha} = \frac{2/3}{\sqrt{5}/3} = \frac{2\sqrt{5}}{5}$$

b) $cos\alpha = \frac{1}{3}$ α es un ángulo del cuarto cuadrante. $\begin{cases} \cos\alpha > 0 \\ \text{sen}\,\alpha < 0 \end{cases}$ $tg\alpha < 0$

$$\text{sen}^2\alpha + \cos^2\alpha = 1$$

$$\text{sen}\,\alpha = -\sqrt{1 - \cos^2\alpha}$$

$$\text{sen}\,\alpha = -\sqrt{\frac{8}{9}}$$

$$\text{sen}\,\alpha = \frac{-2\sqrt{2}}{3}$$

$$tg\,\alpha = \frac{\text{sen}\,\alpha}{\cos\alpha} = \frac{\frac{-2\sqrt{2}}{3}}{1/3} = -2\sqrt{2}$$

c) $tg\alpha = 1$ α está en el tercer cuadrante.

$$\begin{cases} \operatorname{sen}\alpha < 0 \\ \cos\alpha < 0 \end{cases}$$

$$tg\alpha = 1$$

$$tg^2\alpha + 1 = \frac{1}{\cos^2\alpha} \Rightarrow \cos\alpha = -\frac{1}{\sqrt{1+tg^2\alpha}} = -\frac{1}{\sqrt{2}} = \frac{-\sqrt{2}}{2}$$

$$tg\alpha = \frac{\operatorname{sen}\alpha}{\cos\alpha}$$

$$\cos\alpha \cdot tg\alpha = \operatorname{sen}\alpha$$

$$\boxed{\operatorname{sen}\alpha = -\frac{\sqrt{2}}{2}}$$

d) $\sec\alpha = -5$ α está en el segundo cuadrante.

$$\begin{cases} \operatorname{sen}\alpha > 0 \\ \cos\alpha < 0 \\ tg\alpha < 0 \end{cases}$$

$$\sec\alpha = -5 \Rightarrow \cos\alpha = \frac{-1}{5}$$

$$1 + tg^2\alpha = \sec^2\alpha$$

$$tg\alpha = -\sqrt{\sec^2\alpha - 1}$$

$$tg\alpha = -\sqrt{24} \Rightarrow \boxed{tg\alpha = -2\sqrt{6}}$$

$$tg\alpha = \frac{\operatorname{sen}\alpha}{\cos\alpha} \Rightarrow \operatorname{sen}\alpha = tg\alpha \cdot \cos\alpha$$

$$\boxed{\operatorname{sen}\alpha = \frac{2\sqrt{6}}{5}}$$