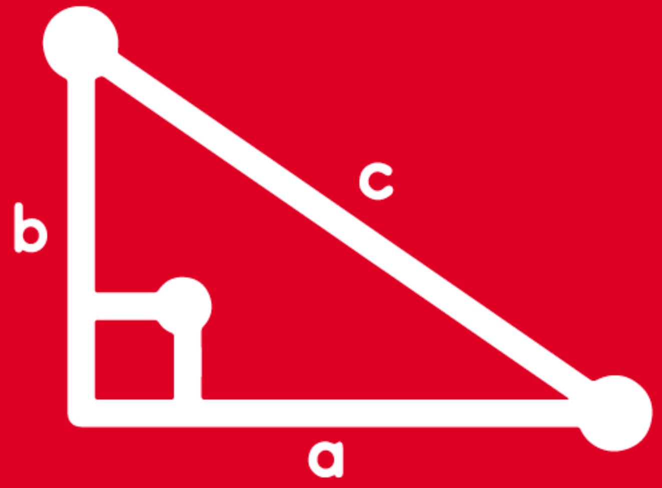
TRIGONOMETRY

Chapter 9

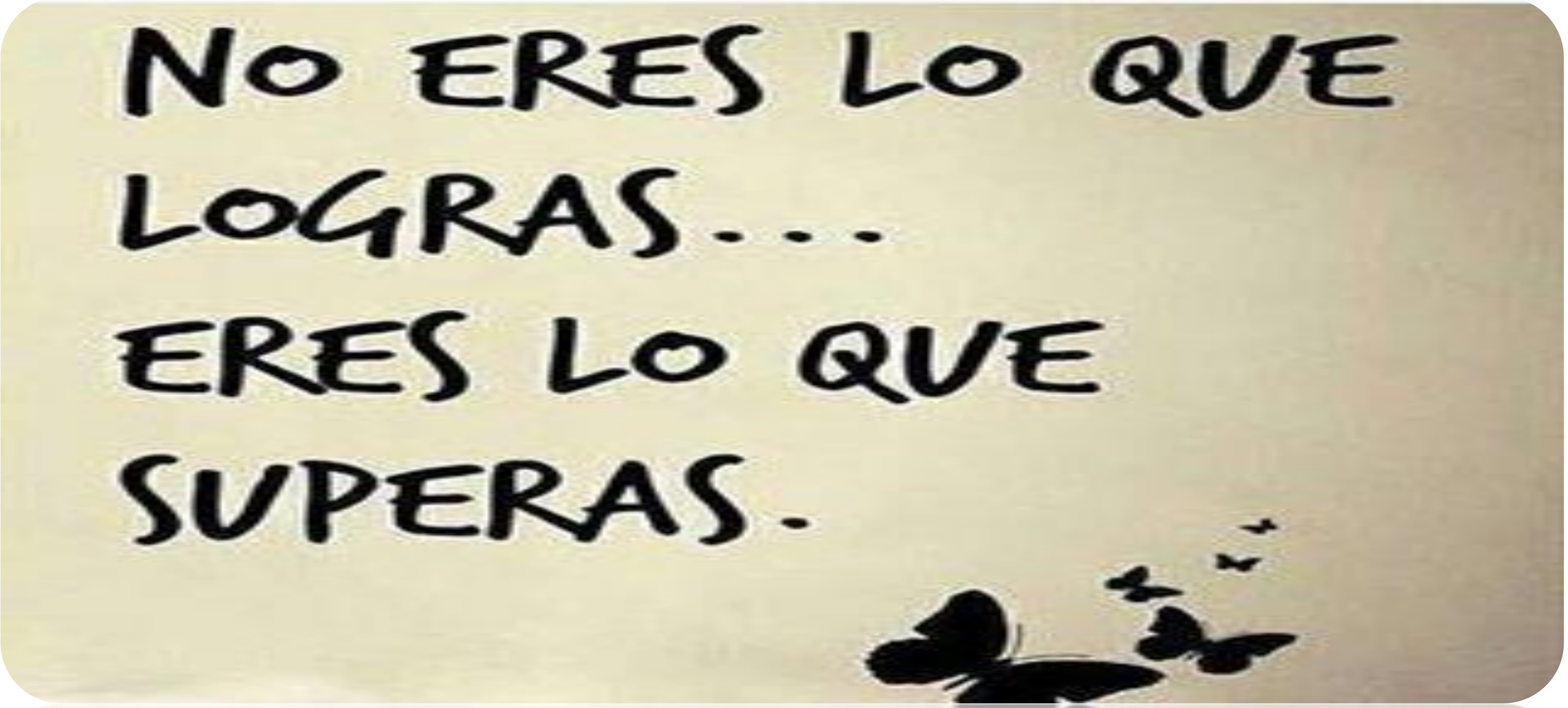
1nd
SECONDARY



Aplicaciones gráficas de los triángulos rectángulos notables

SACO OLIVEROS

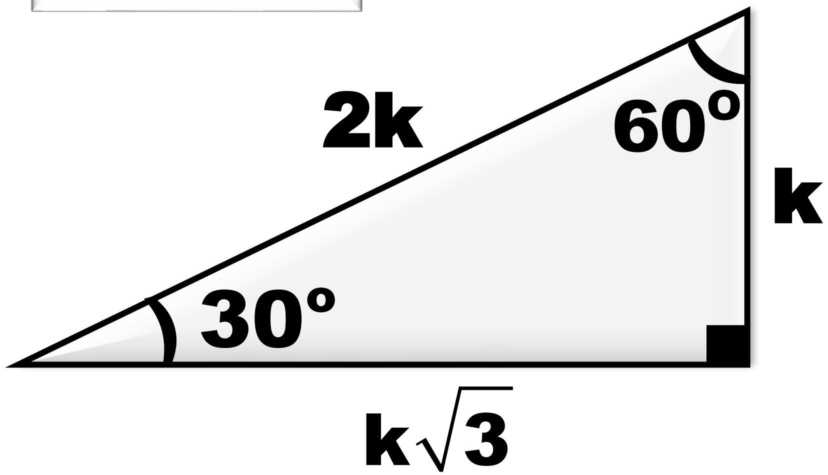
MOTIVATING STRATEGY

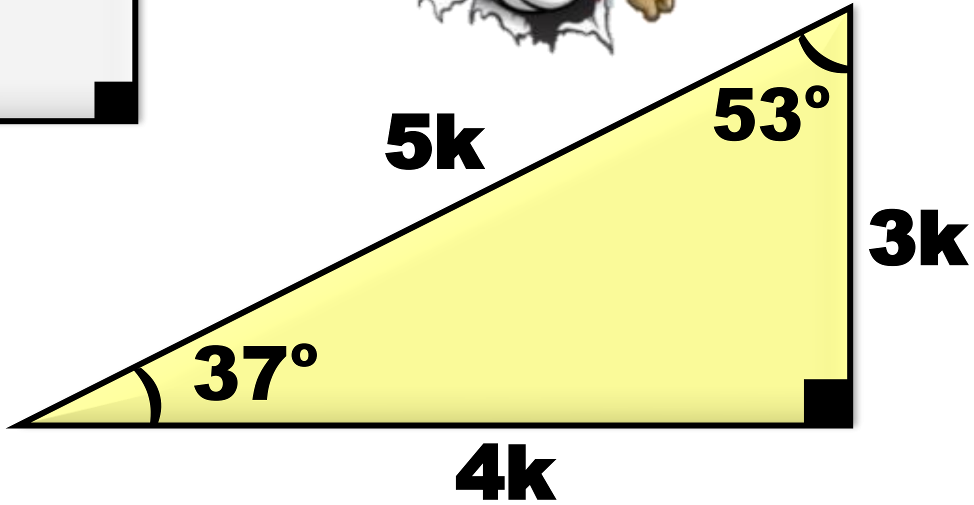


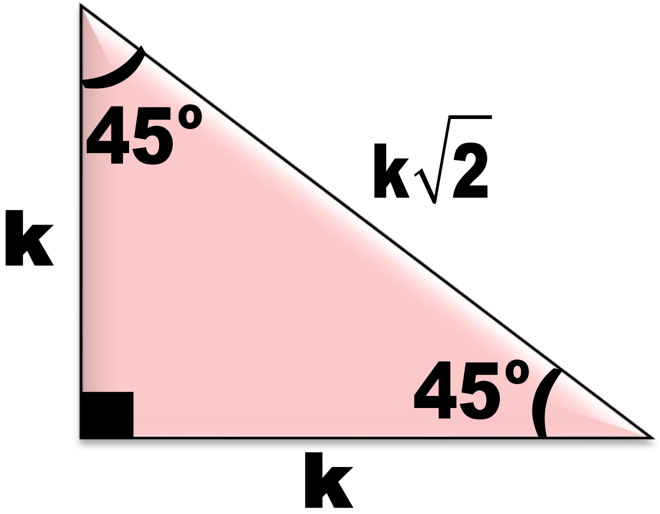
HELICO THEORY

APLICACIONES GRÁFICAS DE LOS TRIÁNGULOS RECTÁNGULOS NOTABLES

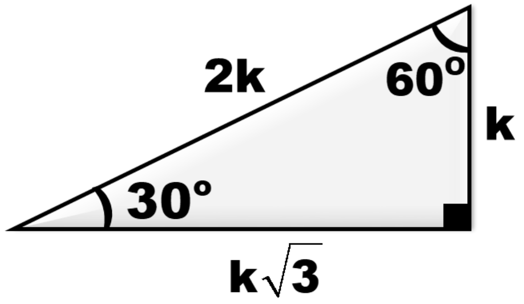
Tenemos:

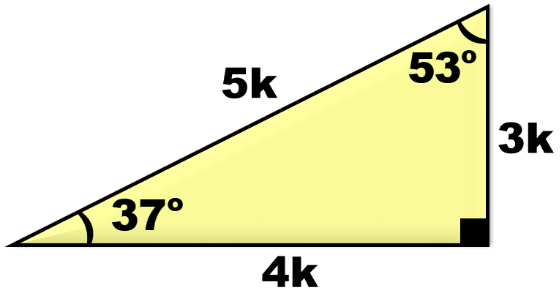


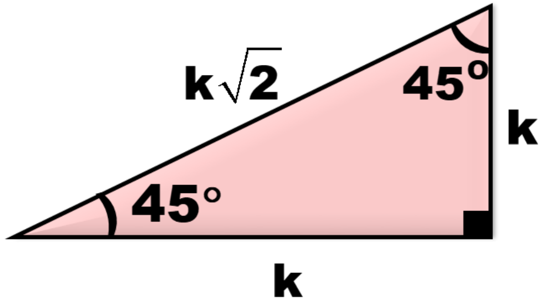




Veamos:







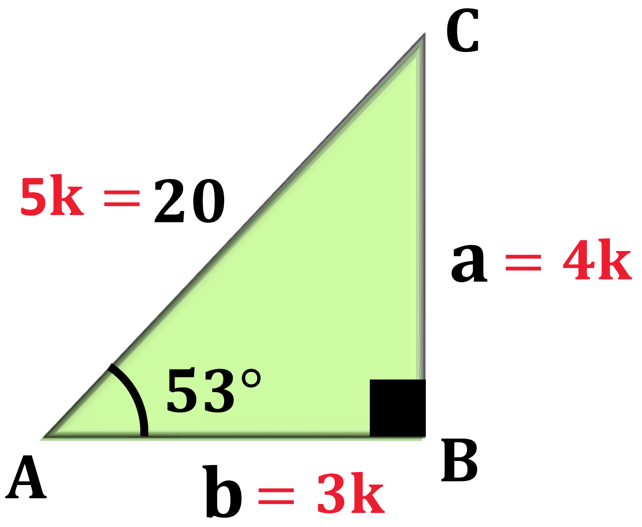
Resumiendo:

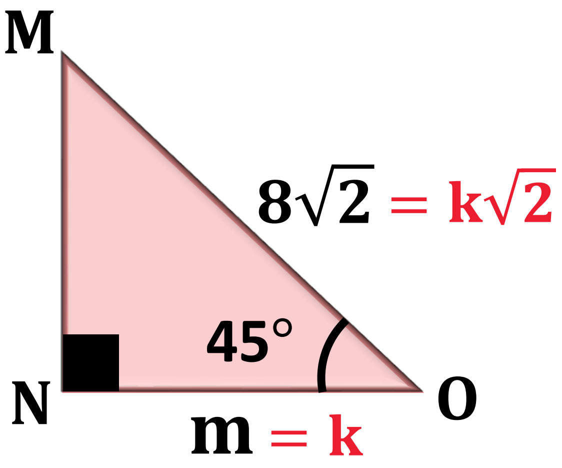
R.T \ ∡	30°	60°	37°	53°	45°
sen	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{3}{5}$	$\frac{4}{5}$	$\frac{1}{\sqrt{2}}$
cos	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\frac{4}{5}$	$\frac{3}{5}$	$\frac{1}{\sqrt{2}}$
tan	$\frac{1}{\sqrt{3}}$	$\sqrt{3}$	$\frac{3}{4}$	$\frac{4}{3}$	1
cot	$\sqrt{3}$	$\frac{1}{\sqrt{3}}$	$\frac{4}{3}$	$\frac{3}{4}$	1
sec	$\frac{2}{\sqrt{3}}$	2	$\frac{5}{4}$	$\frac{5}{3}$	$\sqrt{2}$
csc	2	$\frac{2}{\sqrt{3}}$	$\frac{5}{3}$	$\frac{5}{4}$	$\sqrt{2}$

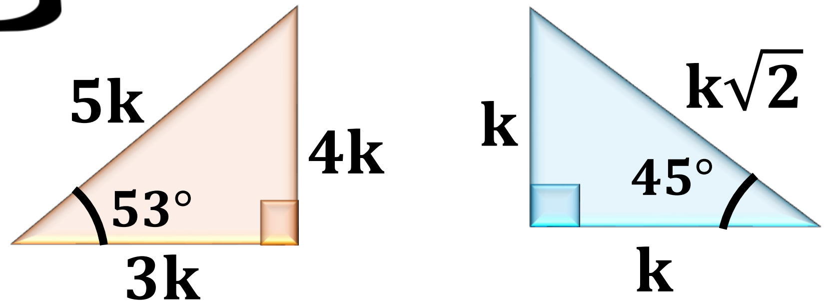
HELICOPRACTICE 1

De los triángulos mostrados, efectúe

$$F = a + b + m$$







Resolución:

En el ΔABC (Notable de 37° y 53°)

Se observa:

$$5k = 20 \Rightarrow k = 4$$

Luego:

$$a = 4k = 4(4) \Rightarrow \boxed{a = 16}$$

$$b = 3k = 3(4) \Rightarrow \boxed{b = 12}$$

En el ΔMNO (Notable de 45°)

Se observa:

$$k\cancel{\sqrt{2}} = 8\cancel{\sqrt{2}} \Rightarrow k = 8$$

Luego:

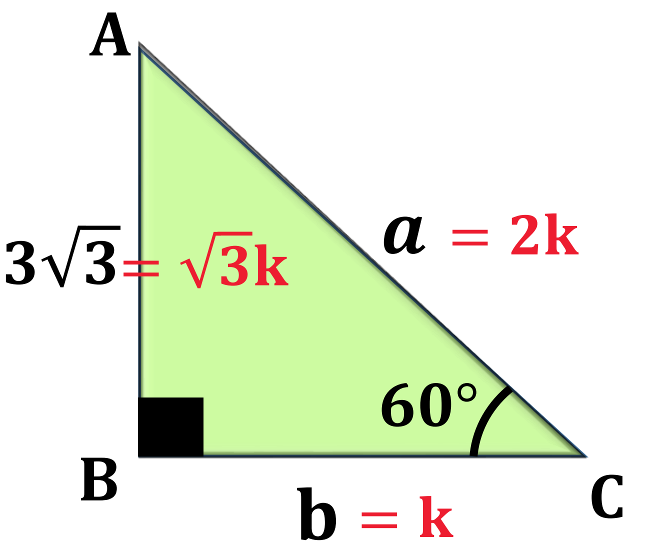
$$m = k \Rightarrow \boxed{m = 8}$$

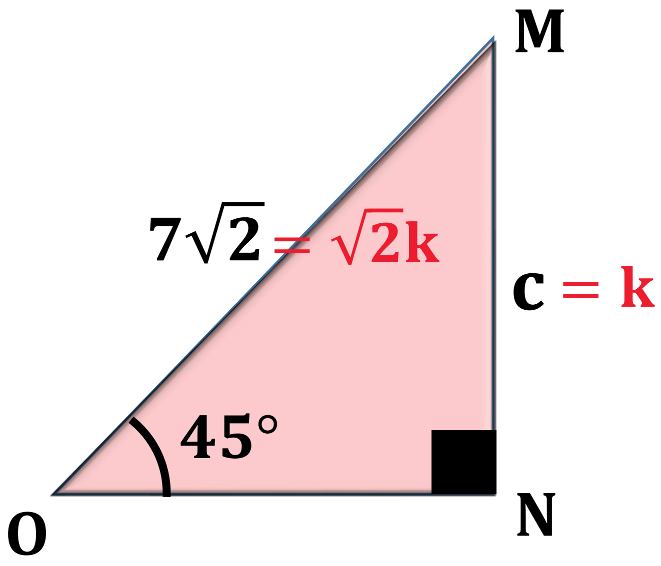
Piden: $F = 16 + 12 + 8$

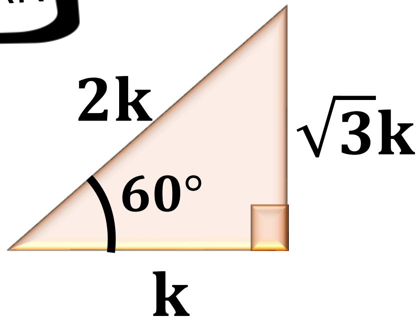
$$\therefore F = 36$$

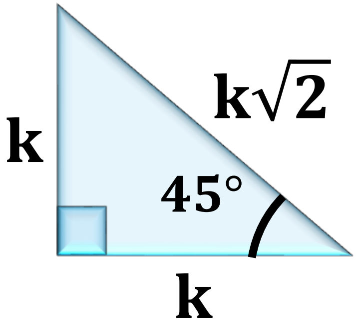
HELICOPRACTICE 2

Calcule a + b+ c en los siguientes triángulos:









Resolución:

En el ΔABC (Notable de 30° y 60°)

Se observa:

$$3\cancel{\sqrt{3}} = \cancel{\sqrt{3}}k \Rightarrow k = 3$$

Luego:

$$a = 2k = 2(3) \Rightarrow \boxed{a = 6}$$

$$b = k = 1(3) \Rightarrow \boxed{b = 3}$$

En el ΔMNO (Notable de 45°)

Se observa:

$$7\cancel{\sqrt{2}} = \cancel{\sqrt{2}}k \Rightarrow k = 7$$

Luego:

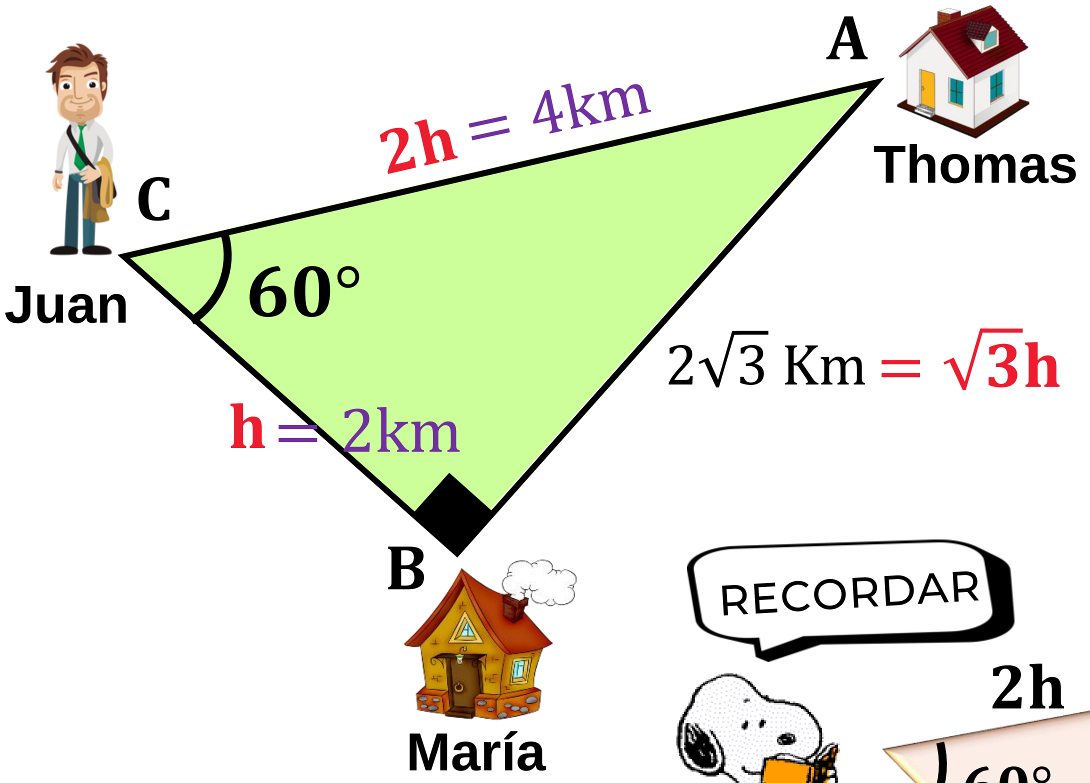
$$c = k \Rightarrow \boxed{c = 7}$$

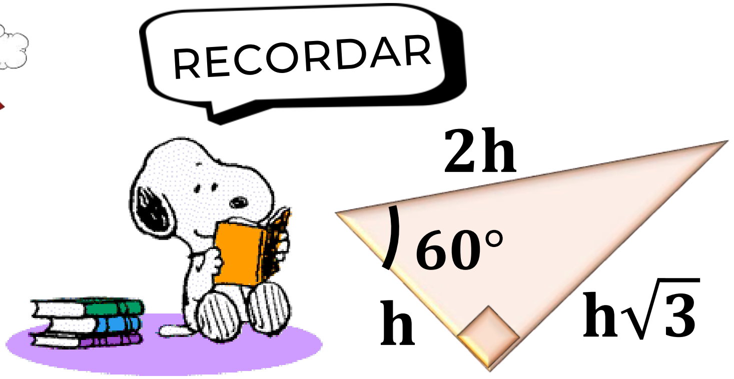
Piden: $P = 6 + 3 + 7$

$$\therefore P = 16$$

HELICOPRACTICE 3

La imagen muestra la ruta que debe tomar Juan para visitar a sus compañeros Thomas y María. Si Juan solo cuenta con tiempo suficiente para visitar a uno de ellos. ¿A quién visitará Juan y por qué?





Resolución:

En el ΔABC (Notable 30° Y 60°)

Se observa:

$$2\cancel{\sqrt{3}} = \cancel{\sqrt{3}}h \Rightarrow h = 2$$

Luego:

$$AC = 2h = 2(2) \Rightarrow \boxed{AC = 4km}$$

$$BC = h = 1(2) \Rightarrow \boxed{BC = 2km}$$

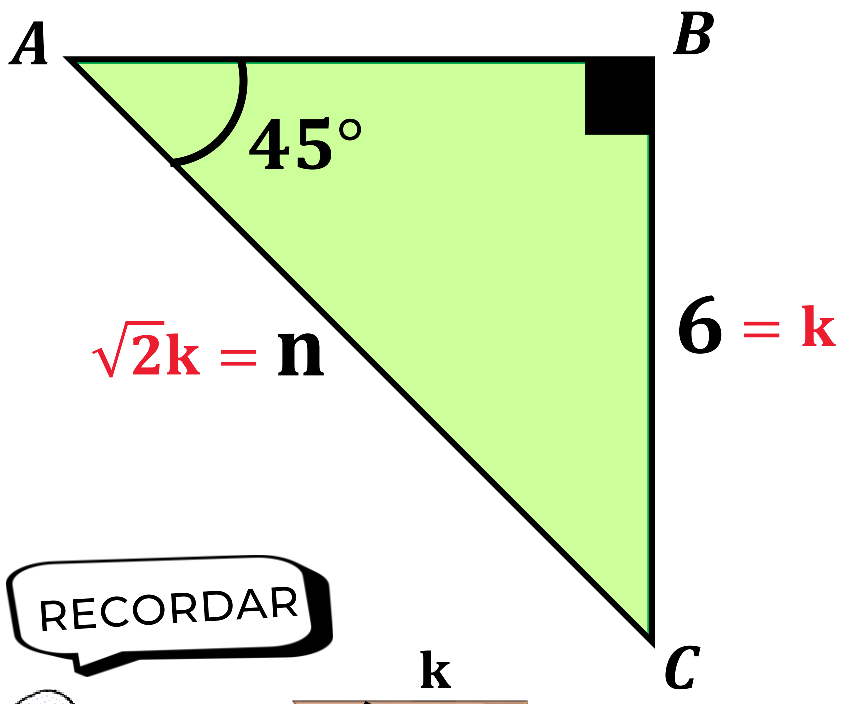
Piden:

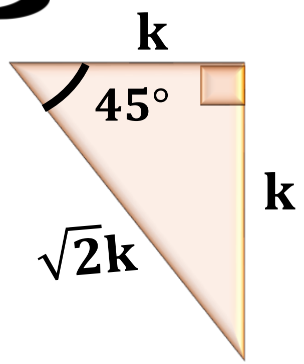
¿A quién visitará Juan y por qué?

$\therefore$ Visitará a María por estar más cerca

HELICOPRACTICE 4

Del gráfico, calcule n^2





Resolución:

En el ΔABC(Notable de 45°)

Se observa:

$$k = 6$$

Luego:

$$n = \sqrt{2}k \Rightarrow \boxed{n = 6\sqrt{2}}$$

Piden:

$$n^2 = (6\sqrt{2})^2$$

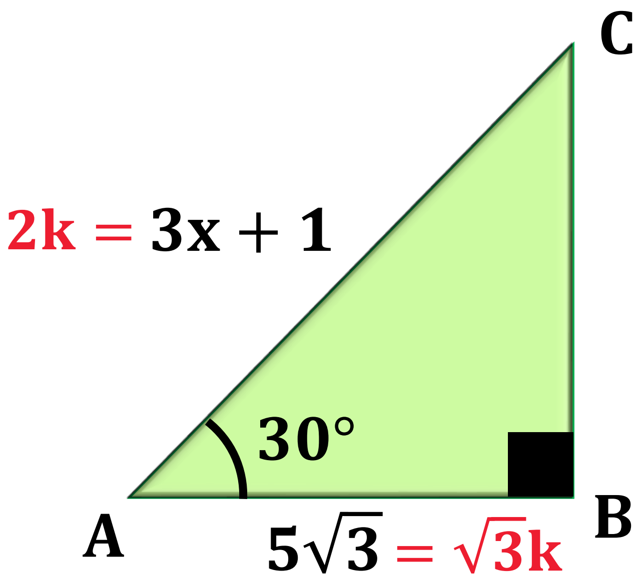
$$n^2 = (6)^2 \times (\sqrt{2})^2$$

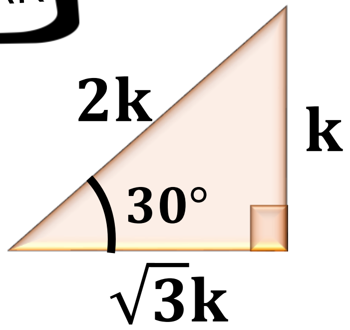
$$n^2 = 36 \times 2$$

$$\therefore n^2 = 72$$

HELICOPRACTICE 5

Del gráfico, calcule el valor de x





Resolución:

En el ΔABC(Notable de 30° y 60°)

Se observa:

$$5\cancel{\sqrt{3}} = \cancel{\sqrt{3}}k \Rightarrow k = 5$$

Luego:

$$3x + 1 = 2k$$

$$3x + 1 = 2(5)$$

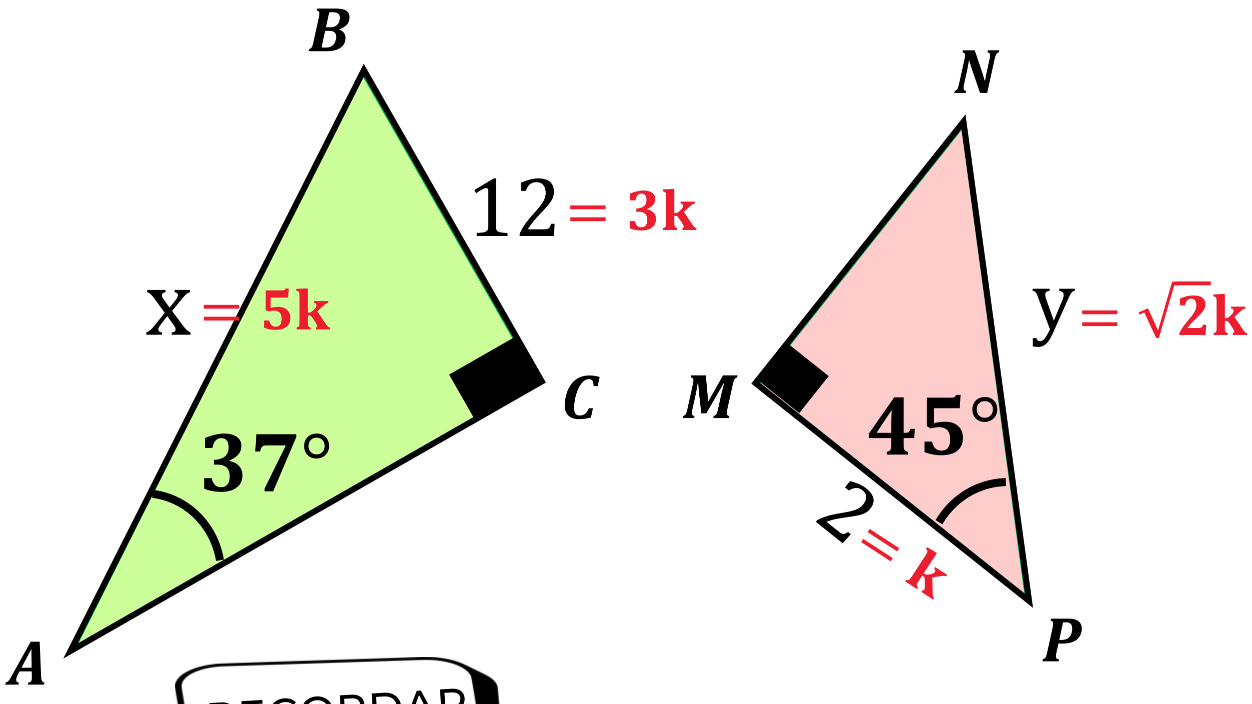
$$3x + 1 = 10$$

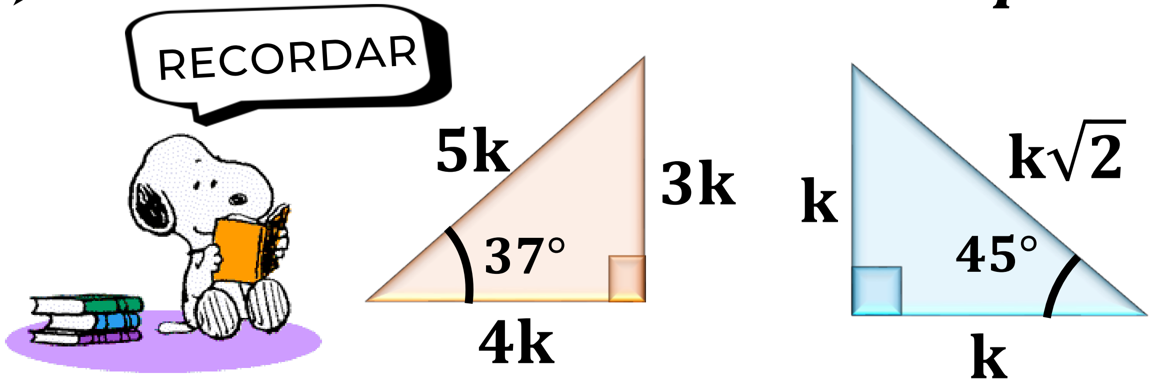
$$3x = 9$$

$$\therefore x = 3$$

HELICOPRACTICE 6

Dado los triángulos rectángulos ABC y MNP calcule el valor de $E = x + y\sqrt{2}$





Resolución:

En el ΔACB (Notable de 37° y 53°)

Se observa:

$$3k = 12 \Rightarrow k = 4$$

Luego:

$$x = 5k = 5(4) \Rightarrow \boxed{x = 20}$$

En el ΔMNP (Notable de 45°)

Se observa: $k = 2$

Luego:

$$y = \sqrt{2}k \Rightarrow \boxed{y = 2\sqrt{2}}$$

Piden:

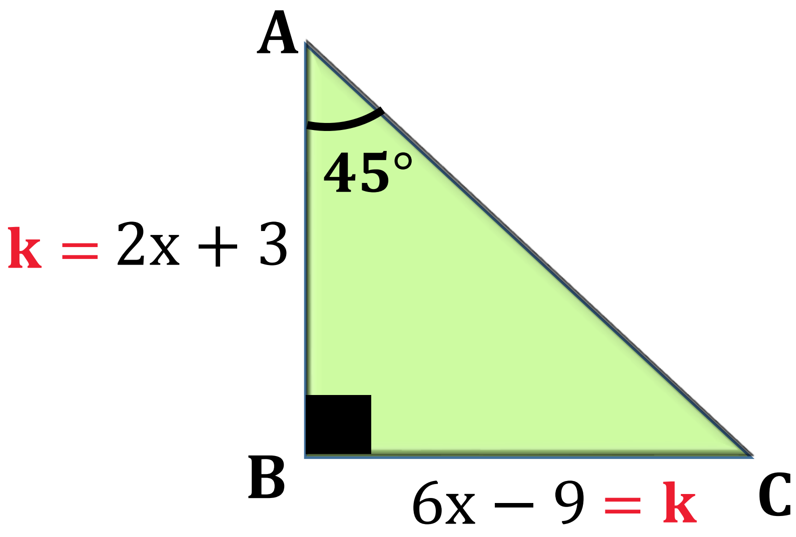
$$F = 20 + 2\sqrt{2} \times \sqrt{2}$$

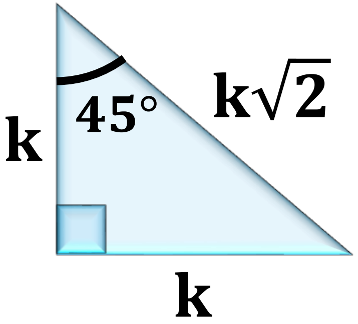
$$F = 20 + 2(2)$$

$$\therefore F = 24$$

HELICOPRACTICE 7

Del gráfico, calcule el valor de x





Resolución:

En el ΔABC (Notable 45°)

En el triángulo rectángulo notable de 45° los catetos son iguales.

Se observa:

$$AB = BC$$

Luego:

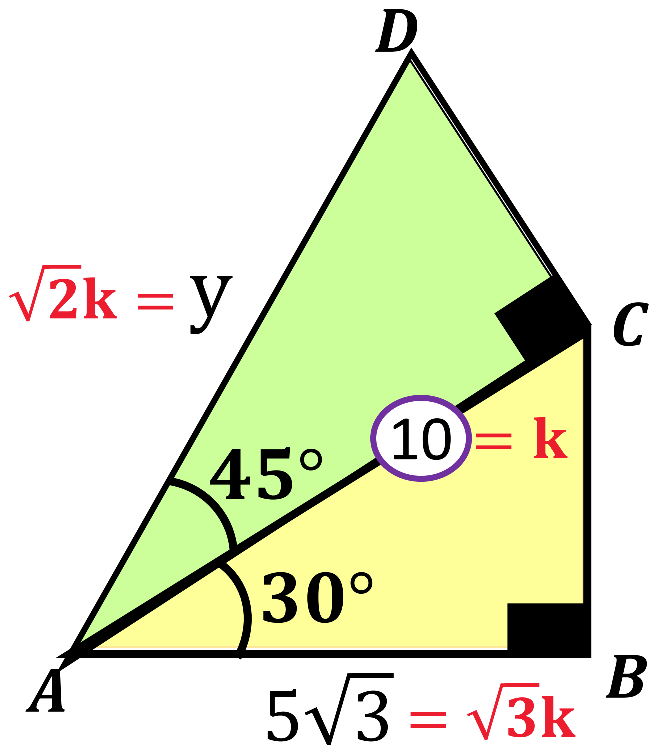
$$2x + 3 = 6x - 9$$

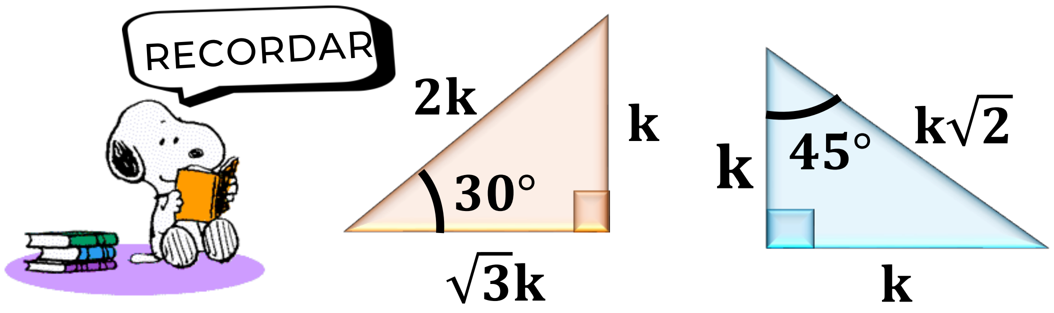
$$12 = 4x$$

$$\therefore x = 3$$

HELICOPRACTICE 8

Del gráfico, calcule el valor de y^2





Resolución:

En el ΔABC (Notable 30° Y 60°)

Se observa: $5\cancel{\sqrt{3}} = \cancel{\sqrt{3}}k \Rightarrow k = 5$

Luego: $AC = 2k = 2(5) \Rightarrow \boxed{AC = 10}$

En el ΔACD (Notable de 45°)

Se observa: $k = 10$

Luego: $y = \sqrt{2}k \Rightarrow \boxed{y = 10\sqrt{2}}$

Piden:

$$n^2 = (10\sqrt{2})^2$$

$$n^2 = (10)^2 \times (\cancel{\sqrt{2}})^{\cancel{2}}$$

$$n^2 = 100 \times 2$$

$$\boxed{\therefore n^2 = 200}$$