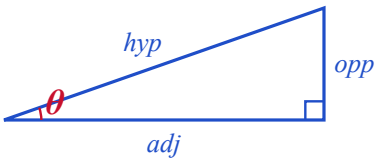
IM2 Cycle T One-Pager (front)

Name _____ Per ____

Trig ratios and their inverses

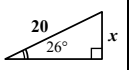
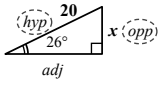
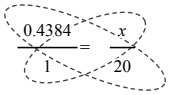
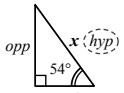
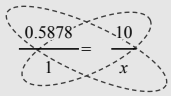
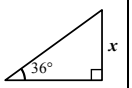
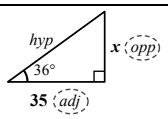
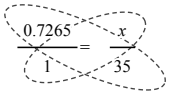
SOH CAH TOA



$\sin\theta = \frac{\text{opp}}{\text{hyp}}$ $\cos\theta = \frac{\text{adj}}{\text{hyp}}$ $\tan\theta = \frac{\text{opp}}{\text{adj}}$

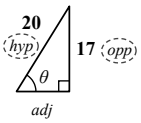
$\sin^{-1}\left(\frac{\text{opp}}{\text{hyp}}\right) = \theta$ $\cos^{-1}\left(\frac{\text{adj}}{\text{hyp}}\right) = \theta$ $\tan^{-1}\left(\frac{\text{opp}}{\text{adj}}\right) = \theta$

Examples: find a side length

The triangle	Step 1: label opp, adj, hyp, circle the two you have *Nombra the lados, encierra the two que tienes*	Step 2: choose the ratio *Escoge the ratio*	Step 3: set up the ratio, then cross multiply and divide *Escribe the ratio, luego cross multiply and divide*
		Soh Cah Toa → **sine**	$\frac{\sin 26°}{1} = \frac{x}{20}$  $1x = 0.4384(20)$ **$x \approx 8.77$**
		Soh Cah Toa → **cosine**	$\frac{\cos 54°}{1} = \frac{10}{x}$  $0.5878x = 1(10)$ $x = \frac{10}{0.5878}$ **$x \approx 17.01$** **x on the bottom: divide**
		Soh Cah Toa → **tangent**	$\frac{\tan 36°}{1} = \frac{x}{35}$  $1x = 0.7265(35)$ **$x \approx 25.43$**

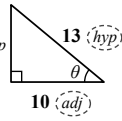
EXAMPLES: FIND THE ANGLE

① Label the sides, circle the two you have. ② Find them in SohCahToa, write the ratio. ③ Use the inverse.
1 Nombra the lados, encierra the two que tienes. 2 Búscalos en SohCahToa, escribe the ratio. 3 Usa the inverse.

① 

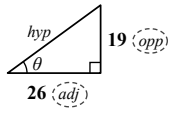
② Soh Cah Toa → $\sin\theta = \frac{17}{20}$

③ $\theta = \sin^{-1}\left(\frac{17}{20}\right)$ **$\theta \approx 58.2°$**

① 

② Soh Cah Toa → $\cos\theta = \frac{10}{13}$

③ $\theta = \cos^{-1}\left(\frac{10}{13}\right)$ **$\theta \approx 39.7°$**

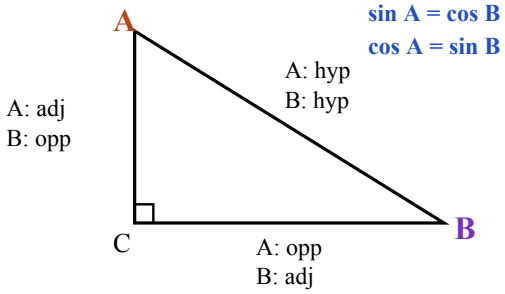
① 

② Soh Cah Toa → $\tan\theta = \frac{19}{26}$

③ $\theta = \tan^{-1}\left(\frac{19}{26}\right)$ **$\theta \approx 36.2°$**

Calculator: press 2nd, then sin, cos or tan, then the ratio, in degree mode.
Calculadora: presiona 2nd, luego sin, cos o tan, luego the ratio, en degree mode.

Complements

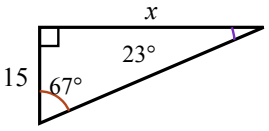


sin A = cos B
cos A = sin B

$\sin A = \frac{\text{opp}}{\text{hyp}} = \frac{BC}{AB}$ $\cos A = \frac{\text{adj}}{\text{hyp}} = \frac{AC}{AB}$

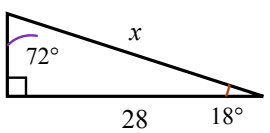
$\sin B = \frac{\text{opp}}{\text{hyp}} = \frac{AC}{AB}$ $\cos B = \frac{\text{adj}}{\text{hyp}} = \frac{BC}{AB}$

Examples: write two equations that could solve for x. *Escribe dos ecuaciones para hallar x.*

1 

$\tan 67° = \frac{x}{15}$

$\tan 23° = \frac{15}{x}$

2 

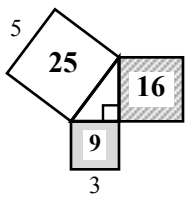
$\sin 72° = \frac{28}{x}$

$\cos 18° = \frac{28}{x}$

Three squares theorem: for every right triangle, leg² + leg² = hyp². *Teorema de los tres cuadrados: en todo right triangle.*

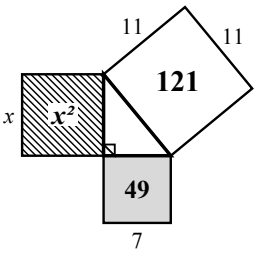
The 3-4-5 picture

Step 1: draw the squares. Step 2: find their areas. Step 3: this + this = this, solve for the missing part.
Paso 1: dibuja los cuadrados. Paso 2: halla sus áreas. Paso 3: esto + esto = esto, resuelve la parte que falta.



$3^2 + 4^2 = 5^2$

□9 + ▨16 = □25



$x^2 + 7^2 = 11^2$

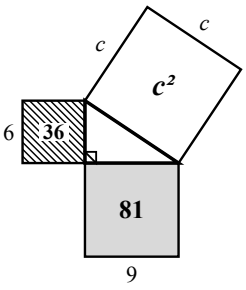
$x^2 + 49 = 121$

$x^2 = 121 - 49$

$x^2 = 72$

$x = \sqrt{72} \approx 8.49$

$\sqrt{72}$ 72



$6^2 + 9^2 = c^2$

36 + 81 = c^2

$117 = c^2$

$c = \sqrt{117} \approx 10.82$

$\sqrt{117}$ 117

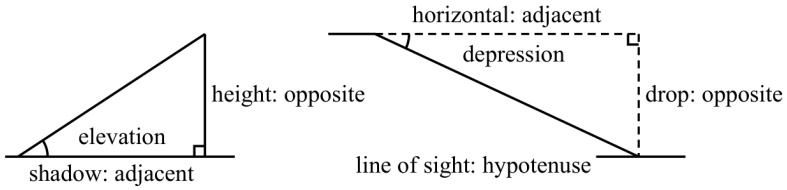
IM2 Cycle T One-Pager (back)

Each block matches one cycle test question, by number: do the blocks for the questions you missed on the practice test. One cell has choices (circle; a select-all can have more than one), the other has none (write the answer, show your work). Figures are not drawn to scale except the special right triangles.

Cada bloque corresponde a una pregunta del examen del ciclo, por número: haz los bloques de las preguntas que fallaste en el examen de práctica. Una celda tiene opciones (encierra; una de seleccionar todas puede tener más de una), la otra no tiene (escribe la respuesta, muestra tu trabajo). Las figuras no están dibujadas a escala excepto the special right triangles.

Math Notes by standard

Math Notes: G-SRT.C.6 Inverse trig: finding the angle



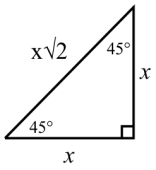
A change in the angle. Two shadows of one height, two triangles: find each angle with the inverse, then subtract. Feet and inches go to feet first: 6 ft 3 in = $6 + \frac{3}{12}$ = 6.25 ft (not 6.3).

Un cambio en the angle. Dos sombras de una altura, dos triangles: halla cada ángulo con la inversa, luego resta. Los pies and pulgadas pasan primero a pies (6.25 ft, no 6.3).

Math Notes: G-SRT.C.8.1 Special right triangles **(for Test #21–25)**

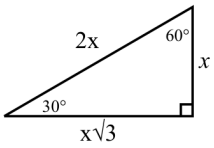
45-45-90 (isosceles right triangle). Legs equal. Hypotenuse = leg · √2; leg = hypotenuse ÷ √2: $\frac{10}{\sqrt{2}} = \frac{10\sqrt{2}}{2} = 5\sqrt{2}$. Right angle on top: the base is the hypotenuse.

Los dos legs son iguales. Hypotenuse = leg · √2. Leg = hypotenuse ÷ √2. Right angle arriba: the base is the hypotenuse.



30-60-90. Short leg across from 30°, half the hypotenuse. Long leg across from 60° = short leg · √3 (from the long leg, divide by √3).

Short leg frente a 30°, la mitad de the hypotenuse. Long leg frente a 60° = short leg · √3 (desde the long leg, divide entre √3).



Exact values. Keep the radical. tan 60° = √3: a 60° angle of elevation makes the height √3 times the distance.

Conserva the radical. tan 60° = √3: un angle of elevation de 60° hace the altura √3 veces the distance.

Roof. The height splits an isosceles roof into two matching 30-60-90 halves: find half the base from the height, then double it.

Techo. The altura divide un techo isosceles en dos mitades 30-60-90 iguales: halla la mitad de la base desde the altura, luego duplícala.

