LESSON MAKER PRO

Trig Ratio Routes

Find exact ratios in right triangles.

HIGH SCHOOL · PC.F.E

PC.F.E "Recognize attributes of trigonometric functions and solve problems involving trigonometry."

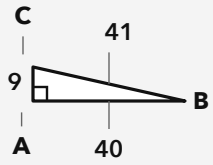
NAME _____ DATE _____

THE BIG IDEA

For an acute angle x in a right triangle, sin x = opposite/hypotenuse and cos x = adjacent/hypotenuse. Use tan x = sin x/cos x and $\sin^2 x + \cos^2 x = 1$ to find other ratios.

WORKED EXAMPLE

Find sin B, cos B, and tan B.



1. From B, the opposite side is 9, the adjacent side is 40, and the hypotenuse is 41.
2. sin B = 9/41 and cos B = 40/41.
3. tan B = (9/41)/(40/41) = 9/40.

Answer: sin B = 9/41, cos B = 40/41, tan B = 9/40

PRACTICE 4 problems

1 If sin x = 3/5 and cos x = 4/5, find tan x.

ANSWER _____

2 If sin x = 12/37 and cos x = 35/37, find tan x.

ANSWER _____

3 If x is acute and sin x = 7/25, find cos x.

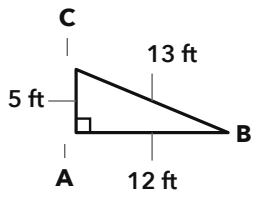
ANSWER _____

4 If x is acute and cos x = 11/61, find sin x.

ANSWER _____

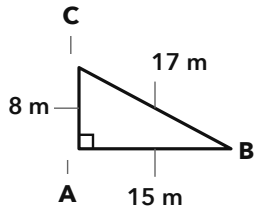
APPLY IT Show your work

1 A skate ramp runs from B to C. Find tan B, its rise-to-run ratio.



ANSWER _____

2 A zip line slopes from C to B. Find sin B, the vertical drop divided by the cable length.



ANSWER _____

CHALLENGE One step up

For an acute angle x, sin x = 20/29. Find tan x and explain why you chose a positive value for cos x.

WORK SPACE AND ANSWER

ANSWER KEY

Trig Ratio Routes

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	If sin x = 3/5 and cos x = 4/5, find tan x.	**3/4**
2	If sin x = 12/37 and cos x = 35/37, find tan x.	**12/35**
3	If x is acute and sin x = 7/25, find cos x.	**24/25**
4	If x is acute and cos x = 11/61, find sin x.	**60/61**

PART 2 · APPLY IT

1. **tan B = 5/12** Divide the 5 ft rise by the 12 ft run.
2. **sin B = 8/17** Divide the 8 m vertical drop by the 17 m cable length.

CHALLENGE

tan x = 20/21. Since x is acute, cos x is positive, so cos x = 21/29.

Accept equivalent exact fractions. The challenge explanation must connect the positive cosine value to x being acute.