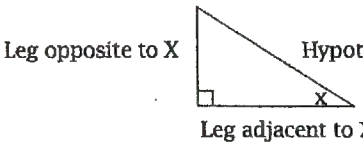
Name Answers Date

8.7 – Tangent, Sine, and Cosine (Part 1)

Use this helpful mnemonic to remember the following ratios: Oscar Has A Heap Of Apples.



$$\text{Sine } x = \frac{\text{Opposite leg}}{\text{Hypotenuse}}$$

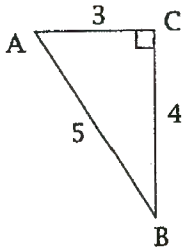
$$\text{Cosine } x = \frac{\text{Adjacent leg}}{\text{Hypotenuse}}$$

$$\text{Tangent } x = \frac{\text{Opposite leg}}{\text{Adjacent leg}}$$

Note: The trigonometric ratios hold only for right triangles.

Given a right triangle find each trigonometric ratio. Leave your answer as a **fraction**. The first three have been done for you.

1.

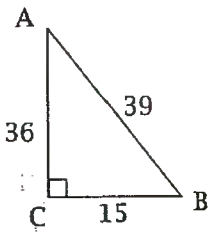


$\sin A = \frac{4}{5}$ $\quad \sin B = \frac{3}{5}$

$\cos A = \frac{3}{5}$ $\quad \cos B = \frac{4}{5}$

$\tan A = \frac{4}{3}$ $\quad \tan B = \frac{3}{4}$

2.



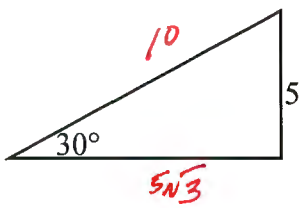
$\sin A = \frac{15}{39} = \frac{5}{13}$ $\quad \sin B = \frac{36}{39} = \frac{12}{13}$

$\cos A = \frac{36}{39} = \frac{12}{13}$ $\quad \cos B = \frac{15}{39} = \frac{5}{13}$

$\tan A = \frac{15}{36} = \frac{5}{12}$ $\quad \tan B = \frac{36}{15} = \frac{12}{5}$

Find the trigonometric ratio for each of the right triangles. Leave your answer as **simplified fraction** and a **decimal**. Round your answer to 4 decimal places.

3.

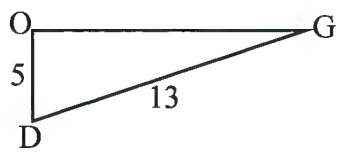


$\sin 30° = \frac{1}{2} = .5$ $\quad \sin 60° = \frac{\sqrt{3}}{2} = .8660$

$\cos 30° = \frac{\sqrt{3}}{2} = .8660$ $\quad \cos 60° = \frac{1}{2} = .5$

$\tan 30° = \frac{\sqrt{3}}{3} = .5774$ $\quad \tan 60° = \frac{\sqrt{3}}{1} = 1.7321$

4.



$\sin D = \frac{12}{13} = .9231$ $\quad \sin G = \frac{5}{13} = .3846$

$\cos D = \frac{5}{12} = .3846$ $\quad \cos G = \frac{12}{13} = .9231$

$\tan D = \frac{12}{5} = 2.4$ $\quad \tan G = \frac{5}{12} = .4167$

Using the Trigonometric Table

Find the trigonometric ratio of the following using your trigonometric table.

5. $\sin 30° =$ .5000

6. $\cos 45° =$ .7071

7. $\sin 60° =$ .8660

8. $\tan 45° =$ 1.0000

9. $\cos 22° =$ .9272

10. $\tan 48° =$ 1.1106

Using the trigonometric table, find the closest whole degree measure that will give you the following trigonometric ratio.

11. $\cos x = .7660$

$x \approx 40°$

12. $\tan x = .4040$

$x = 22°$

13. $\sin x = .9520$

$x = 72°$

14. $\sin \theta = .8000$

$\theta \approx 53°$

15. $\cos\theta = \frac{1}{2}$

$\theta \approx 60°$

16. $\tan\theta = \frac{3}{4}$

$\theta \approx 37°$

17. $\sin\theta = \frac{\sqrt{3}}{2}$

18. $\cos\theta = \frac{\sqrt{2}}{2}$

Using your calculator, find the angle with the given trigonometric. Round your answer to the nearest degree.

19. $\cos x = \frac{7}{19}$

20. $\tan x = \frac{101}{90}$

21. $\sin x = \frac{20}{21}$

22. $\cos x = \frac{45}{76}$

23. $\tan x = \frac{15}{4}$

24. $\sin x = \frac{8}{99}$