Name: _____

Solving Trig Ratios to Determine Sides

On the previous worksheet, you created trig ratios to determine sides on a right triangle. Today, you will take those ratios you found on "Creating Trig Ratios…" (the problems for today are the answers to the previous worksheet) and solve them for the unknown side (x).

Example 1:

$$\sin(24^\circ) = \frac{7}{x}$$

$$\frac{\sin(24^\circ)}{1} = \frac{7}{x}$$

$$x\sin(24^\circ) = 7$$

$$\frac{x\boxed{\sin(24^\circ)}}{\boxed{\sin(24^\circ)}} = \frac{7}{\boxed{\sin(24^\circ)}}$$

$$x = \frac{7}{\boxed{\sin(24^\circ)}}$$

$$x = \frac{7}{0.4067}$$

$$x = \boxed{17.2}$$

.4067 ⟌ 7.000000

17.21

4067 ⟌ 70000.00

-4067

29330

-28469

8610

-8134

4760

4 4

4067

x 7

28469

1 1

4067

x 2

8134

Example 2:

$$\cos(24^\circ) = \frac{x}{7}$$

$$\frac{\cos(24^\circ)}{1} = \frac{x}{7}$$

$$7\cos(24^\circ) = x$$

$$7\boxed{\cos(24^\circ)} = x$$

$$7(0.9135) = x$$

$$7(0.9135) = x$$

$$x = \boxed{6.4}$$

6 2 3

0.9135

x 7

6.3945

Example 3:

$$\tan(24^\circ) = \frac{7}{x} \quad \textbf{OR} \quad \tan(66^\circ) = \frac{x}{7}$$

$$\frac{\tan(24^\circ)}{1} = \frac{7}{x} \qquad \frac{\tan(66^\circ)}{1} = \frac{x}{7}$$

$$x\tan(24^\circ) = 7 \qquad 7\tan(66^\circ) = x$$

$$\frac{x\boxed{\tan(24^\circ)}}{\boxed{\tan(24^\circ)}} = \frac{7}{\boxed{\tan(24^\circ)}} \qquad 7\boxed{\tan(66^\circ)} = x$$

$$x = \frac{7}{\boxed{\tan(24^\circ)}} \qquad 7(2.2460) = x$$

$$x = \frac{7}{0.4452} \qquad x = \boxed{15.7}$$

$$x = \boxed{15.7}$$

.4452 ⟌ 7.000000

15.72

4452 ⟌ 70000.00

-4452

25480

-22260

32200

-31164

10360

2 2 1

4452

x 5

22260

3 3 1

4452

x 7

31164

1

4452

x 2

8904

OR

1 3 4

2.2460

x 7

15.7220

1. $\tan(75^\circ) = \frac{x}{7}$ **OR** $\tan(15^\circ) = \frac{7}{x}$

2. $\cos(75^\circ) = \frac{x}{7}$

3. $\sin(75^\circ) = \frac{x}{7}$

4. $\tan(83^\circ) = \frac{6}{x}$ **OR** $\tan(7^\circ) = \frac{x}{6}$

5. $\cos(83^\circ) = \frac{x}{6}$

6. $\sin(83^\circ) = \frac{x}{6}$

7. $cos(73^\circ) = \frac{2}{x}$	8. $sin(73^\circ) = \frac{2}{x}$	9. $tan(73^\circ) = \frac{x}{2}$ **OR** $tan(17^\circ) = \frac{2}{x}$
10. $tan(29^\circ) = \frac{x}{4}$ **OR** $tan(61^\circ) = \frac{4}{x}$	11. $sin(29^\circ) = \frac{4}{x}$	12. $cos(29^\circ) = \frac{x}{4}$
13. $sin(38^\circ) = \frac{x}{10}$	14. $cos(38^\circ) = \frac{x}{10}$	15. $tan(38^\circ) = \frac{x}{10}$ **OR** $tan(52^\circ) = \frac{10}{x}$

Answers to this worksheet: "Solving Trig Ratios…"

1. 26.1	2. 1.8	3. 6.8	4. 0.7	5. 0.7
6. 6.0	7. 6.8	8. 2.1	9. 6.5	10. 2.2
11. 8.3	12. 3.5	13. 6.2	14. 7.9	15. 7.8

Remaining answers to the previous worksheet: "Creating Trig Ratios…"

16. $cos(33^\circ) = \frac{x}{9}$	17. $tan(33^\circ) = \frac{9}{x}$ **OR** $tan(57^\circ) = \frac{x}{9}$	18. $sin(33^\circ) = \frac{x}{9}$	19. $sin(57^\circ) = \frac{5}{x}$	20. $tan(57^\circ) = \frac{x}{5}$ **OR** $tan(33^\circ) = \frac{5}{x}$	21. $cos(57^\circ) = \frac{x}{5}$
22. $cos(27^\circ) = \frac{x}{8}$	23. $tan(27^\circ) = \frac{8}{x}$ **OR** $tan(63^\circ) = \frac{x}{8}$	24. $sin(27^\circ) = \frac{x}{8}$	25. $sin(47^\circ) = \frac{x}{3}$	26. $cos(47^\circ) = \frac{x}{3}$	27. $tan(47^\circ) = \frac{3}{x}$ **OR** $tan(43^\circ) = \frac{x}{3}$