

When you want to determine a side:

Step 1: Cross multiply the trig ratio (do not simplify using the angle inside the trig). If the side is alone, stop.

Step 2: If the side is not alone, divide both sides by $\sin(\text{angle})$, $\cos(\text{angle})$ or $\tan(\text{angle})$.

<p>EXAMPLE: $\cos(31) = \frac{HK}{6}$ $\frac{\cos(31)}{1} = \frac{HK}{6}$ <i>put the trig over 1</i> <i>& cross multiply.</i> $6[\cos(31)] = HK$ DO NOT SIMPLIFY!! $HK = 6[\cos(31)]$</p>	<p>EXAMPLE: $\sin(70) = \frac{5}{NP}$ $\frac{\sin(70)}{1} = \frac{5}{NP}$ <i>put the trig over 1</i> <i>& cross multiply.</i> $NP[\sin(70)] = 5$ <i>Divide by $\sin(70)$</i> $\div \sin(70)$ $\div \sin(70)$ DO NOT SIMPLIFY!! $NP = \frac{5}{\sin(70)}$</p>	<p>1. $\tan(25) = \frac{7}{LM}$</p>
<p>2. $\cos(51) = \frac{PQ}{8}$</p>	<p>3. $\sin(74) = \frac{GH}{9}$</p>	<p>4. $\tan(18) = \frac{4}{WY}$</p>
<p>5. $\sin(68) = \frac{3}{KL}$</p>	<p>6. $\tan(9) = \frac{2}{RS}$</p>	<p>7. $\cos(85) = \frac{EG}{1}$</p>

When you want to determine an angle:

Switch the angle with the fraction, and write $^{-1}$ next to \sin , \cos or \tan .

<p>EXAMPLE: $\tan(A) = \frac{3}{7}$ $\tan^{-1}\left(\frac{3}{7}\right) = m\angle A$ $m\angle A = \tan^{-1}\left(\frac{3}{7}\right)$</p>	<p>EXAMPLE: $\cos(B) = \frac{8}{9}$ $\cos^{-1}\left(\frac{8}{9}\right) = m\angle B$ $m\angle B = \cos^{-1}\left(\frac{8}{9}\right)$</p>	<p>8. $\sin(M) = \frac{5}{7}$</p>
<p>9. $\cos(P) = \frac{1}{8}$</p>	<p>10. $\sin(G) = \frac{7}{9}$</p>	<p>11. $\tan(Y) = \frac{3}{8}$</p>
<p>12. $\sin(K) = \frac{6}{7}$</p>	<p>13. $\tan(R) = \frac{9}{2}$</p>	<p>14. $\cos(E) = \frac{5}{8}$</p>

Using Trig to Isolate Parts Answers

1. $LM = \frac{7}{\tan(25)}$	2. $PQ = 8[\cos(47)]$	3. $GH = 9[\sin(74)]$	4. $WY = \frac{4}{\tan(18)}$
6. $RS = \frac{2}{\tan(9)}$	7. $EG = \cos(85)$	8. $m\angle M = \sin^{-1}\left(\frac{5}{7}\right)$	9. $m\angle P = \cos^{-1}\left(\frac{1}{8}\right)$
11. $m\angle Y = \tan^{-1}\left(\frac{3}{8}\right)$	12. $m\angle K = \sin^{-1}\left(\frac{6}{7}\right)$	13. $m\angle R = \tan^{-1}\left(\frac{9}{2}\right)$	14. $m\angle E = \cos^{-1}\left(\frac{5}{8}\right)$

Table of Trigonometric Values

<i>Angle</i>	<i>Fraction as a decimal</i>		
	$\angle A$	$\sin A$	$\cos A$
1°	0.0175	0.9998	0.0175
2°	0.0349	0.9994	0.0349
3°	0.0523	0.9986	0.0524
4°	0.0698	0.9976	0.0699
5°	0.0872	0.9962	0.0875
6°	0.1045	0.9945	0.1051
7°	0.1219	0.9925	0.1228
8°	0.1392	0.9903	0.1405
9°	0.1564	0.9877	0.1584
10°	0.1736	0.9848	0.1763
11°	0.1908	0.9816	0.1944
12°	0.2079	0.9781	0.2126
13°	0.2250	0.9744	0.2309
14°	0.2419	0.9703	0.2493
15°	0.2588	0.9659	0.2679
16°	0.2756	0.9613	0.2867
17°	0.2924	0.9563	0.3057
18°	0.3090	0.9511	0.3249
19°	0.3256	0.9455	0.3443
20°	0.3420	0.9397	0.3640
21°	0.3584	0.9336	0.3839
22°	0.3746	0.9272	0.4040
23°	0.3907	0.9205	0.4245
24°	0.4067	0.9135	0.4452
25°	0.4226	0.9063	0.4663
26°	0.4384	0.8988	0.4877
27°	0.4540	0.8910	0.5095
28°	0.4695	0.8829	0.5317
29°	0.4848	0.8746	0.5543
30°	0.5000	0.8660	0.5774
31°	0.5150	0.8572	0.6009
32°	0.5299	0.8480	0.6249
33°	0.5446	0.8387	0.6494
34°	0.5592	0.8290	0.6745
35°	0.5736	0.8192	0.7002
36°	0.5878	0.8090	0.7265
37°	0.6018	0.7986	0.7536
38°	0.6157	0.7880	0.7813
39°	0.6293	0.7771	0.8098
40°	0.6428	0.7660	0.8391
41°	0.6561	0.7547	0.8693
42°	0.6691	0.7431	0.9004
43°	0.6820	0.7314	0.9325
44°	0.6947	0.7193	0.9657
45°	0.7071	0.7071	1.0000

<i>Angle</i>	<i>Fraction as a decimal</i>		
	$\angle A$	$\sin A$	$\cos A$
46°	0.7193	0.6947	1.0355
47°	0.7314	0.6820	1.0724
48°	0.7431	0.6691	1.1106
49°	0.7547	0.6561	1.1504
50°	0.7660	0.6428	1.1918
51°	0.7771	0.6293	1.2349
52°	0.7880	0.6157	1.2799
53°	0.7986	0.6018	1.3270
54°	0.8090	0.5878	1.3764
55°	0.8192	0.5736	1.4281
56°	0.8290	0.5592	1.4826
57°	0.8387	0.5446	1.5399
58°	0.8480	0.5299	1.6003
59°	0.8572	0.5150	1.6643
60°	0.8660	0.5000	1.7321
61°	0.8746	0.4848	1.8040
62°	0.8829	0.4695	1.8807
63°	0.8910	0.4540	1.9626
64°	0.8988	0.4384	2.0503
65°	0.9063	0.4226	2.1445
66°	0.9135	0.4067	2.2460
67°	0.9205	0.3907	2.3559
68°	0.9272	0.3746	2.4751
69°	0.9336	0.3584	2.6051
70°	0.9397	0.3420	2.7475
71°	0.9455	0.3256	2.9042
72°	0.9511	0.3090	3.0777
73°	0.9563	0.2924	3.2709
74°	0.9613	0.2756	3.4874
75°	0.9659	0.2588	3.7321
76°	0.9703	0.2419	4.0108
77°	0.9744	0.2250	4.3315
78°	0.9781	0.2079	4.7046
79°	0.9816	0.1908	5.1446
80°	0.9848	0.1736	5.6713
81°	0.9877	0.1564	6.3138
82°	0.9903	0.1392	7.1154
83°	0.9925	0.1219	8.1443
84°	0.9945	0.1045	9.5144
85°	0.9962	0.0872	11.4301
86°	0.9976	0.0698	14.3007
87°	0.9986	0.0523	19.0811
88°	0.9994	0.0349	28.6363
89°	0.9998	0.0175	57.2900

When you want to determine a side:

- Step 1: Identify the trig ratio you are using (*sin*, *cos* or *tan*)
 Step 2: Search down your trig ratio's column until you reach the focus angle measure.
 Step 3: Replace *sin*(angle), *cos*(angle) or *tan*(angle) entirely by the four digit decimal.
 Step 4: Multiply or divide as needed.
 Step 5: Round to the nearest tenth.

EXAMPLE: $HK = 6[\cos(31)]$

Angle	Fraction as a decimal		
$\angle A$	<i>sin</i> A	<i>cos</i> A	<i>tan</i> A
31°	0.5150	0.8572	0.6009
27°	0.4540	0.8280	0.6740

$$HK = 6[\cos(31)]$$

$$HK = 6(0.8572)$$

$$HK = 5.1432$$

$$HK = \boxed{5.1}$$

EXAMPLE: $NP = \frac{5}{\sin(70)}$

Angle	Fraction as a decimal		
$\angle A$	<i>sin</i> A	<i>cos</i> A	<i>tan</i> A
70°	0.9397	0.3420	2.7475

$$NP = \frac{5}{0.9397}$$

$$NP = 5.32$$

$$NP = \boxed{5.3}$$

$$\begin{array}{r} .9397 \overline{) 5.0} \\ \underline{4.6985} \\ 30150 \\ \underline{28191} \\ 19590 \\ \underline{18794} \\ 796 \end{array}$$

.9397 $\overline{) 5.0}$
 Move the decimal!
 5.32

1. $LM = \frac{7}{\tan(25)}$

2. $PQ = 8[\cos(47)]$

3. $GH = 9[\sin(74)]$

4. $WY = \frac{4}{\tan(18)}$

When you want to determine an angle:

Step 1: Divide the fraction and round to four digits.

Step 2: Identify the trig ratio you are using (*sin*, *cos* or *tan*)

Step 3: Search down your trig ratio's column until you reach the two closest decimals – one will be smaller & one will be bigger than your decimal. These are the two options you will use in step 4.

Step 4: Determine which of the two options is closer to your decimal by subtracting each from/to your decimal one at a time.

Step 5: Identify the angle measure to the left of the closest decimal. That is your answer.

EXAMPLE: $m\angle C = \tan^{-1}\left(\frac{2}{3}\right)$

$m\angle C = \tan^{-1}(0.6667)$

According to the table of values, If $m\angle C = \tan^{-1}(0.6667)$, then $m\angle C$ is either 33° or 34° . Subtract to find out which.

Angle	Fraction as a decimal		
	<i>sin</i> A	<i>cos</i> A	<i>tan</i> A
33°	0.5446	0.8387	0.6494
34°	0.5592	0.8290	0.6745

5,	0.6666
6	6 7
-	6494
.	0173
6,	6745
7	4 5
-	6667
.	0078

Since 0.6745 is closer to 0.6667 than 0.6494, $m\angle C = 34^\circ$.

Divide $\frac{2}{3}$:

$$\begin{array}{r} 0.66666 \\ 3 \overline{) 2.00000} \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 2 \end{array}$$

5. $m\angle M = \sin^{-1}\left(\frac{5}{7}\right)$

6. $m\angle P = \cos^{-1}\left(\frac{1}{8}\right)$

7. $m\angle G = \sin^{-1}\left(\frac{7}{9}\right)$

8. $m\angle Y = \tan^{-1}\left(\frac{3}{8}\right)$

Using a Trig Table to Solve Answers

1. $LM = 15.0$	2. $PQ = 5.5$	3. $GH = 8.7$	4. $WY = 12.3$
8. $m\angle M = 46^\circ$	9. $m\angle P = 83^\circ$	10. $m\angle G = 51^\circ$	11. $m\angle Y = 21^\circ$