

# Chapter 9- Lesson 2

## Right Triangle Magic

### Goals

Learn some right triangle magic.

Create your own right triangle magic trick.

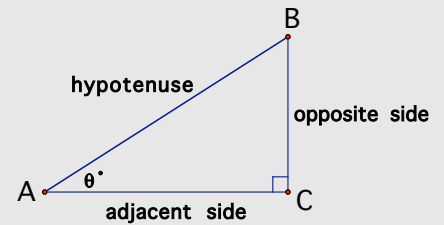
1. Without showing anyone else, draw a right triangle in standard position. Now measure the length of the adjacent side and the length of the hypotenuse. Grab your calculator and calculate the ratio

**length of adjacent side : length of hypotenuse side**

Write it down, but don't show anyone.

For the magic to work, you have to be very accurate!

### Standard Position and Reference Angles



The triangle above is shown drawn in “standard position” where  $\angle A$  is the angle whose measure is denoted by the greek letter  $\theta$  (“theta” pronounced “they ta”).

2. Describe the magic trick.

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3. Explain why the magic trick worked (words $\geq$ 50).

4. You try the trick! Record your work.

Student	Adjacent : Hypotenuse Ratio	Measure of Reference Angle	Did the magic work?

## Geometry: Chapter 9- Lesson 2— Right Triangle Magic

5. What other tricks like this could you do?

6. Complete the table below.

What I know about right triangle trigonometry.	What I want to know about right triangle trigonometry.

### Right Triangle Sides Ratios Table

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

Name \_\_\_\_\_

Date \_\_\_\_\_

Class # \_\_\_\_\_

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Angle °	adjacent : hypotenuse	opposite : hypotenuse	opposite : adjacent
45	0.7071	0.7071	1.0000
46	0.6947	0.7193	1.0355
47	0.6820	0.7314	1.0724
48	0.6691	0.7431	1.1106
49	0.6561	0.7547	1.1504
50	0.6428	0.7660	1.1918
51	0.6293	0.7771	1.2349
52	0.6157	0.7880	1.2799
53	0.6018	0.7986	1.3270
54	0.5878	0.8090	1.3764
55	0.5736	0.8192	1.4281
56	0.5592	0.8290	1.4826
57	0.5446	0.8387	1.5399
58	0.5299	0.8480	1.6003
59	0.5150	0.8572	1.6643
60	0.5000	0.8660	1.7321
61	0.4848	0.8746	1.8040
62	0.4695	0.8829	1.8807
63	0.4540	0.8910	1.9626
64	0.4384	0.8988	2.0503
65	0.4226	0.9063	2.1445
66	0.4067	0.9135	2.2460
67	0.3907	0.9205	2.3559
68	0.3746	0.9272	2.4751
69	0.3584	0.9336	2.6051
70	0.3420	0.9397	2.7475
71	0.3256	0.9455	2.9042
72	0.3090	0.9511	3.0777
73	0.2924	0.9563	3.2709
74	0.2756	0.9613	3.4874
75	0.2588	0.9659	3.7321
76	0.2419	0.9703	4.0108
77	0.2250	0.9744	4.3315
78	0.2079	0.9781	4.7046
79	0.1908	0.9816	5.1446
80	0.1736	0.9848	5.6713
81	0.1564	0.9877	6.3138
82	0.1392	0.9903	7.1154
83	0.1219	0.9925	8.1443
84	0.1045	0.9945	9.5144
85	0.0872	0.9962	11.4301
86	0.0698	0.9976	14.3007
87	0.0523	0.9986	19.0811
88	0.0349	0.9994	28.6363
89	0.0175	0.9998	57.2900