

# L01 - Trigonometric Ratios

## Part 1a - Labelling Sides

Opposite - The side that is *opposite* to the angle.

Adjacent - The side that is *adjacent* to the angle.

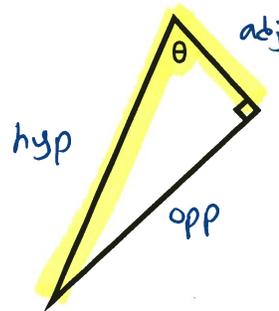
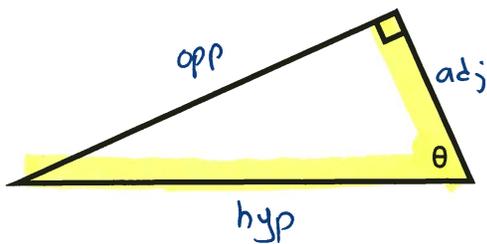
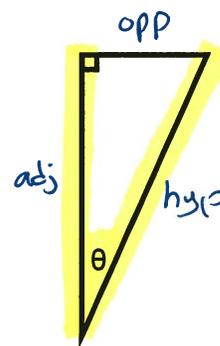
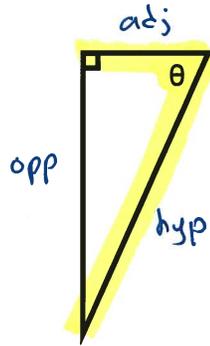
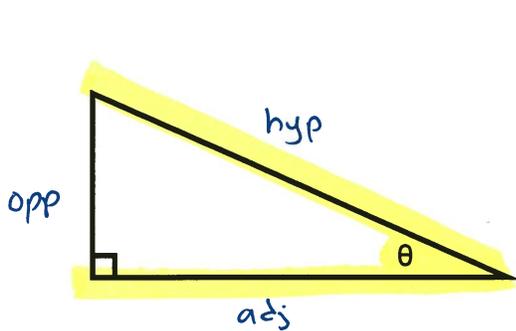
Hypotenuse - The *long diagonal* side.

① Two sides touch the angle. (highlight).

Which side is opposite?

② The adjacent connects the angle to the 90°.

③ The hypotenuse is the long diagonal.



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Part 1b - Labelling Sides using Numerical Response

Use the following information to answer Q1:

**Labelling the Sides of a Triangle**

**Side Orientation**

- 1 - Diagonal ↗
- 2 - Horizontal ←
- 3 - Vertical ↓

Q1: Use the numbers above to identify each side of the triangle.

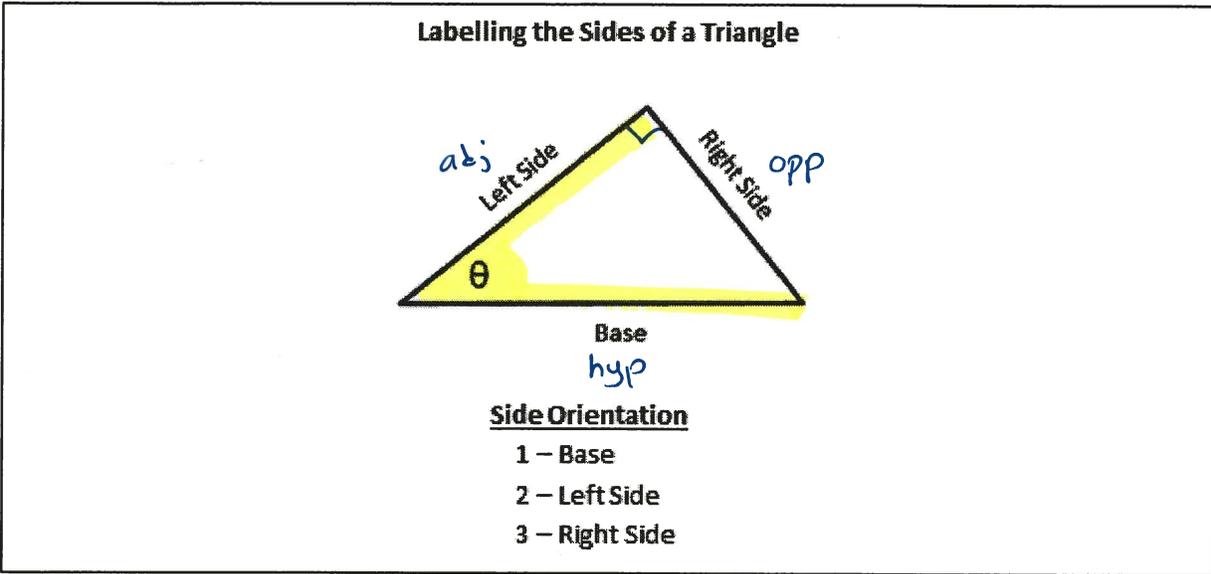
Orientation:       3                          1                          2    
 Description:    Adjacent                      Hypotenuse                      Opposite

(Record your three-digit answer in the Numerical Response boxes below)

3	1	2	
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Use the following information to answer Q2:



Q2: Use the numbers above to identify each side of the triangle.

Orientation:          2                              1                              3      
 Description:    Adjacent                      Hypotenuse                      Opposite

(Record your three-digit answer in the Numerical Response boxes below)

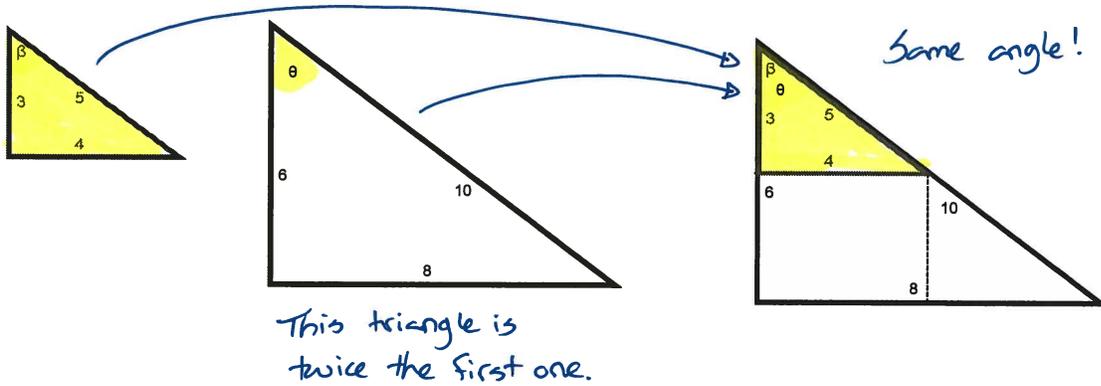
2	1	3	
---	---	---	--

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Part 2 - Similar Triangles and Ratios

What do a 3-4-5 triangle and a 6-8-10 triangle have in common?

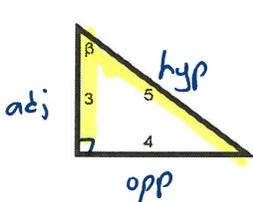
HINT: Think in terms of angles and ratios.



Part 3a - Trig Ratios

SohCahToa

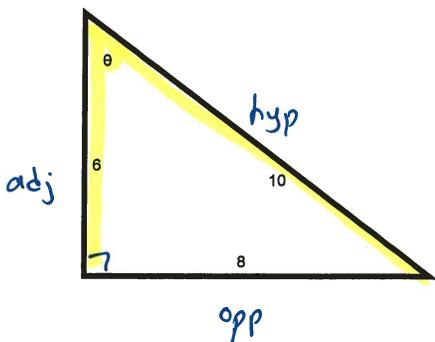
$$\sin \theta = \frac{o}{h} \quad \cos \theta = \frac{a}{h} \quad \tan \theta = \frac{o}{a}$$



$$\sin \beta = \frac{o}{h} = \frac{4}{5} = 0.8$$

$$\cos \beta = \frac{a}{h} = \frac{3}{5} = 0.6$$

$$\tan \beta = \frac{o}{a} = \frac{4}{3} = 1.\bar{3}$$



$$\sin \theta = \frac{o}{h} = \frac{8}{10} = 0.8$$

$$\cos \theta = \frac{a}{h} = \frac{6}{10} = 0.6$$

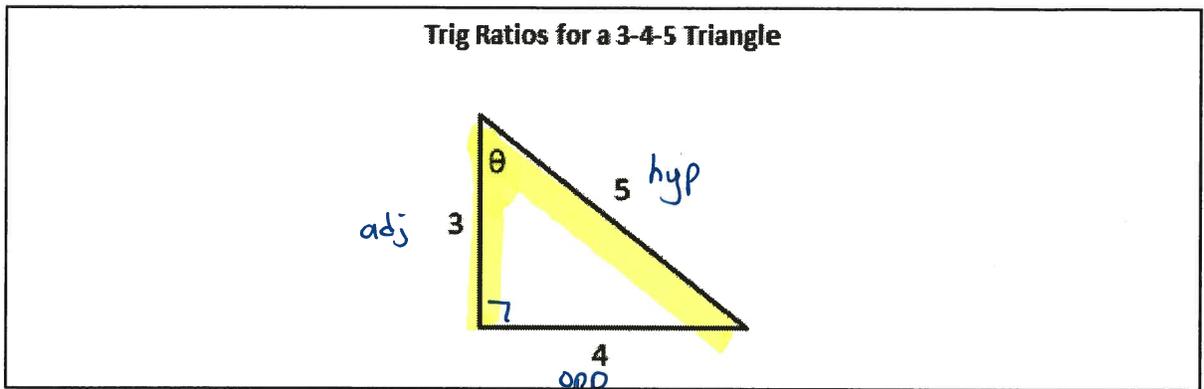
$$\tan \theta = \frac{o}{a} = \frac{8}{6} = 1.\bar{3}$$

For triangles with same angles, ratios of sides are the same!

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Part 3b - Trig Ratios using Numerical Response

Use the following information to answer Q3-Q5:



Q3: For the triangle above, the ratio  $\sin \theta = \frac{a}{b}$  where the integers  $a$  and  $b$  are 4 and 5.   
 (Record your two digit answer in the Numerical Response boxes below)

*This Numerical Response variable does not mean the same as "adjacent". Be careful!*

4	5		
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$$\sin \theta = \frac{o}{h} = \frac{4}{5}$$

Q4: What is the value of  $\cos \theta$ ?

(Record your three digit answer in the Numerical Response boxes below)

0	.	6	0
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$$\cos \theta = \frac{a}{h} = \frac{3}{5} = 0.60$$

Q5: What is the value of  $\tan \theta$ , accurate to the nearest tenth?

(Record your answer in the Numerical Response boxes below)

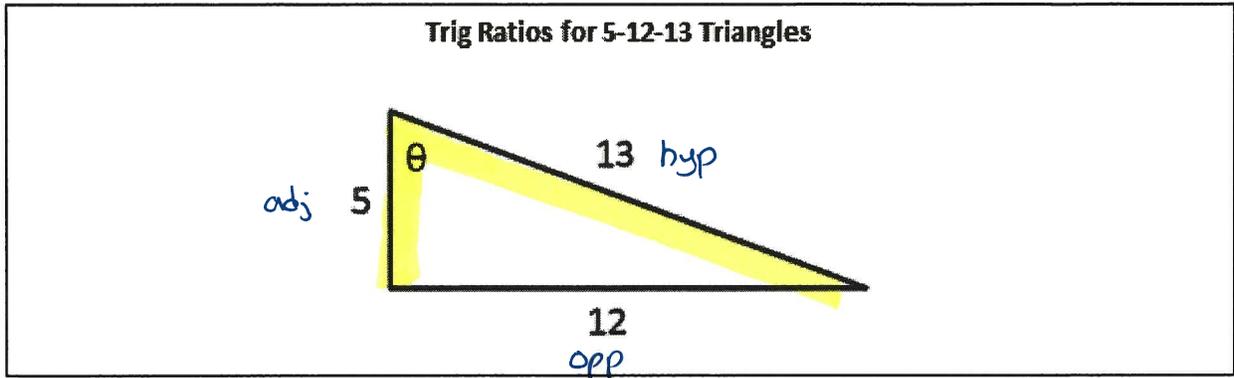
1	.	3	
---	---	---	--

$$\tan \theta = \frac{o}{a} = \frac{4}{3} = 1.333... \approx 1.3$$

↑  
Tenth

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Use the following information to answer Q6-8:



Q6: For the triangle above, the ratio  $\tan \theta = \frac{ab}{c}$  where the integers  $a$ ,  $b$ , and  $c$  are \_\_, \_\_, and \_\_.

(Record your three digit answer in the Numerical Response boxes below)

1	2	5	
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$$\tan \theta = \frac{o}{a} = \frac{12}{5}$$

Q7: What is the value of  $\tan \theta$ ?

(Record your two digit answer in the Numerical Response boxes below)

2	.	4	
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$$\tan \theta = \frac{12}{5} = 2.4$$

Q8: What is the value of  $\tan \theta$ , accurate to the nearest hundredth?

(Record your answer in the Numerical Response boxes below)

2	.	4	0
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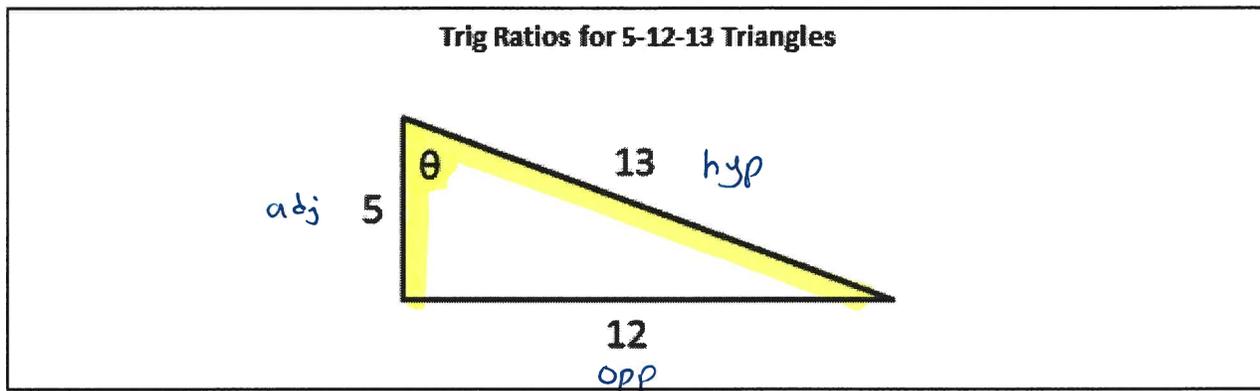
$$\tan \theta = \frac{12}{5} = 2.40$$

↑  
Hundredth

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Part 3c - Trig Ratios using Numerical Response and Scientific Notation

Use the following information to answer Q9-11:



Q9: The value of  $\sin \theta$  is  $a.bc \times 10^d$ , where  $a$ ,  $b$ ,  $c$ , and  $d$  are \_\_, \_\_, \_\_, and \_\_.

(Record your answer in the Numerical Response boxes below)

9	2	3	1
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$$\sin \theta = \frac{o}{h} = \frac{12}{13} = 0.923076\dots$$

$$\approx 9.23 \times 10^{-1}$$

$$a.bc \times 10^d$$

a = 9  
b = 2  
c = 3  
d = 1

Q10: The value of  $\cos \theta$  is  $a.bc \times 10^d$ , where  $a$ ,  $b$ ,  $c$ , and  $d$  are \_\_, \_\_, \_\_, and \_\_.

(Record your answer in the Numerical Response boxes below)

3	8	5	1
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$$\cos \theta = \frac{a}{h} = \frac{5}{13} = 0.3846\dots$$

$$\approx 3.85 \times 10^{-1}$$

$$a.bc \times 10^d$$

a = 3  
b = 8  
c = 5  
d = 1

Q11: The value of  $\tan \theta$  is  $a.bc \times 10^d$ , where  $a$ ,  $b$ ,  $c$ , and  $d$  are \_\_, \_\_, \_\_, and \_\_.

(Record your answer in the Numerical Response boxes below)

2	4	0	0
---	---	---	---

$$\tan \theta = \frac{o}{a} = \frac{12}{5} = 2.40$$

$$\approx 2.40 \times 10^0$$

$$a.bc \times 10^d$$

a = 2  
b = 4  
c = 0  
d = 0