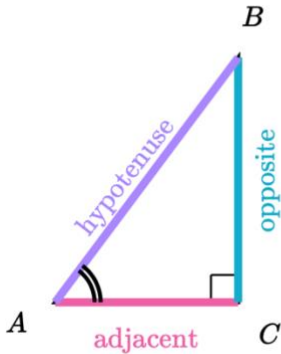# NOTES:
CHAPTER 10 TRIGONOMETRY

1. BASIC TRIGONOMETRIC RATIOS

$$\sin(A) = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos(A) = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan(A) = \frac{\text{opposite}}{\text{adjacent}}$$

Acronym Part	Verbal Description
SOH	Sine is Opposite over Hypotenuse
CAH	Cosine is Adjacent over Hypotenuse
TOA	Tangent is Opposite over Adjacent

*Images taken from *Khan Academy*

2. TRIGONOMETRIC VALUES OF NEGATIVE ANGLES

$$\sin(-\theta) = -\sin\theta$$
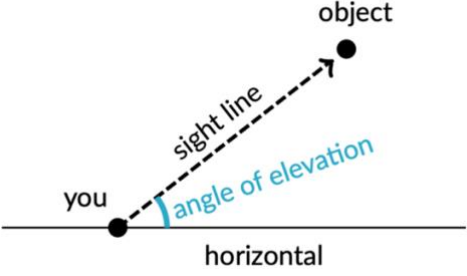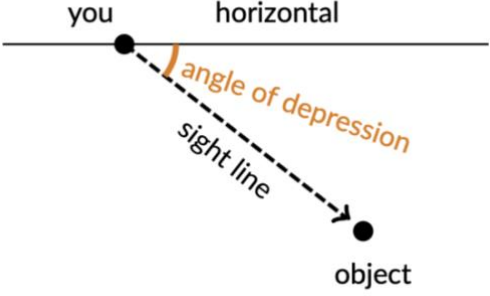$$\cos(-\theta) = \cos\theta$$
$$\tan(-\theta) = -\tan\theta$$

3. SINE AND COSINE OF COMPLEMENTARY ANGLES
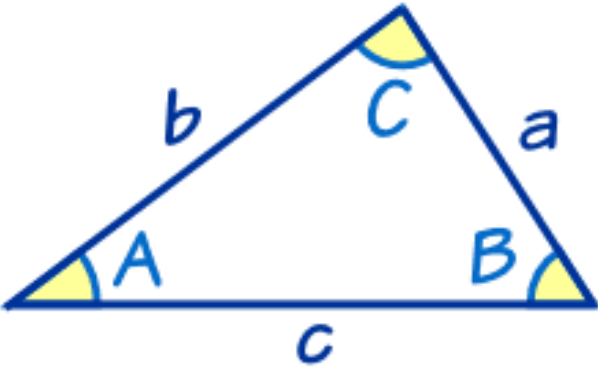
$$\sin(\theta) = \cos(90° - \theta)$$

4. SINE AND COSINE OF SUPPLEMENTARY ANGLES

$$\sin(\theta) = \sin(180 - \theta)$$

$$\cos(\theta) = -\cos(180 - \theta)$$

5. ANGLE OF ELEVATION vs. ANGLE OF DEPRESSION

ANGLE OF ELEVATION	ANGLE OF DEPRESSION
When you see an object above you, there's an angle of elevation between the horizontal and your line of sight to the object.	Similarly, when you see an object below you, there's an angle of depression between the horizontal and your line of sight to the object.

6. SINE LAW AND COSINE LAW

SINE LAW

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

COSINE LAW

$$a^2 = b^2 + c^2 - 2bc \cos A$$
$$b^2 = a^2 + c^2 - 2ac \cos B$$
$$c^2 = a^2 + b^2 - 2ab \cos C$$

7. BEARINGS

North

Bearing of 90°

90°

North

Bearing of 315°

315°

North

45°

X

Y

315°

Look at course XY:

Bearing of Y position to line $XY = 315°$
Bearing of X position to line $XY = 45°$

N

60°

Bearing 060°

N

240°

Bearing 240°

N

330°

Bearing 330°