

The MATHEMATICS SECTION of the THEA Test contains questions from fundamental mathematics, algebra, geometry, and problem solving. The first few pages of the section will provide important definitions and formulas you may refer to during the test. These pages will be similar to this handout, which was taken from “The Official TASP Test Study Guide”, published by NES. Feel free to refer to this handout as you prepare for the test.

### Definitions

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=	is equal to	$m\angle$	measure of angle	$\overline{AB}$	line segment joining points A and B
$\neq$	is not equal to	$\perp$	right angle		
$\approx$	is approximately equal to	$\square$	triangle		
>	is greater than	$\perp$	is perpendicular to	$\overline{AB}$	line containing points A and B
<	is less than		is parallel to		
$\geq$	is greater than or equal to	$\sim$	is similar to	$m(\overline{AB})$	length of $\overline{AB}$
$\leq$	is less than or equal to	$\cong$	is congruent to	$AB$	length of $\overline{AB}$
$\pi$	$\approx 3.14$	$\not\cong$	is not congruent to	$ \overline{AB} $	length of $\overline{AB}$
$\angle$	angle	$\pm$	plus or minus	$\frac{a}{b}$	or a:b ratio of a to b

### Abbreviations for Units of Measurement

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U.S. Standard			Metric					
<b>Distance</b>	in.	inch	<b>Distance</b>	m	meter	<b>Time</b>	sec.	second
	ft.	foot		km	kilometer		min.	minute
	mi.	mile		cm	centimeter		hr.	hour
			mm	millimeter				
<b>Volume</b>	gal.	gallon	<b>Volume</b>	L	liter			
	qt.	quart		mL	milliliter			
	oz.	ounce		cc	cubic centimeter			
<b>Mass</b>	lb.	pound	<b>Mass</b>	g	gram			
	oz.	ounce		kg	kilogram			
				mg	milligram			
<b>Temperature</b>	$^{\circ}\text{F}$	degree Fahrenheit	<b>Temperature</b>	$^{\circ}\text{C}$	degree Celsius			
<b>Speed</b>	mph	miles per hour						

## Conversions for Units of Measurement

U.S. Standard		Metric	
<b>Length</b>	12 inches = 1 foot	<b>Length</b>	10 millimeters = 1 centimeter
	3 feet = 1 yard		100 centimeters = 1 meter
	5280 feet = 1 mile		1000 meters = 1 kilometer
<b>Volume (liquid)</b>	8 ounces = 1 cup	<b>Volume</b>	1000 milliliters = 1 liter
	2 cups = 1 pint		1000 liters = 1 kiloliter
	2 pints = 1 quart		
	4 quarts = 1 gallon		
<b>Weight</b>	16 ounces = 1 pound	<b>Weight</b>	1000 milligrams = 1 gram
	2000 pounds = 1 ton		1000 grams = 1 kilogram
	<b>Time</b>		
	60 seconds = 1 minute		
	60 minutes = 1 hour		
	24 hours = 1 day		

## Formulas

**Quadratic Formula** If  $ax^2 + bx + c = 0$  and  $a \neq 0$ ,  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

**Line** slope  $m = \frac{y_2 - y_1}{x_2 - x_1}$

Slope-intercept form for the equation of a line:  
Point-slope form for the equation of a line:

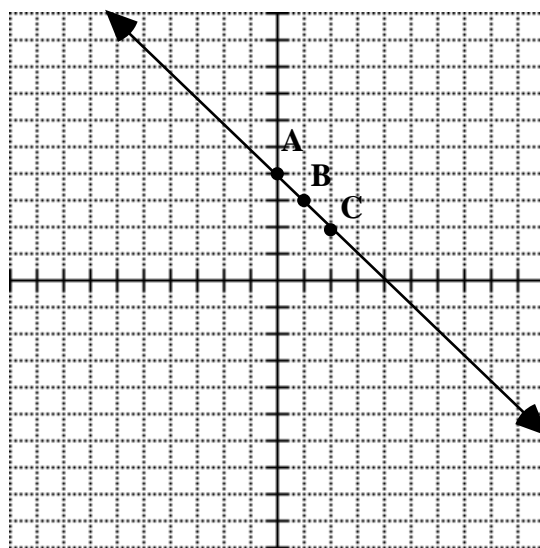
$$y = mx + b$$

$$y - y_1 = m(x - x_1)$$

**Distance**  $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

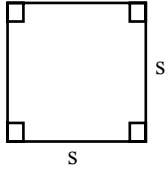
**Midpoint Formula**  $(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$

**Distance**  $d = rt$



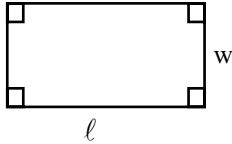
**A** (0, b)      **B** (x<sub>1</sub>, y<sub>1</sub>)      **C** (x<sub>2</sub>, y<sub>2</sub>)

## Square



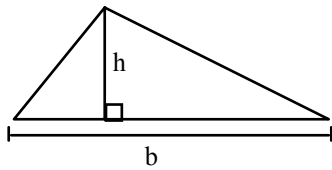
$$\text{Area} = s^2$$
$$\text{Perimeter} = 4s$$

## Rectangle



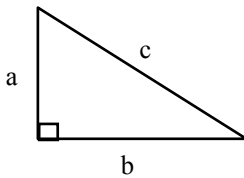
$$\text{Area} = lw$$
$$\text{Perimeter} = 2l + 2w$$

## Triangle



$$\text{Area} = \frac{1}{2} bh$$

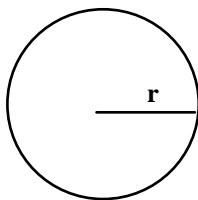
## Right Triangle



Pythagorean Theorem :

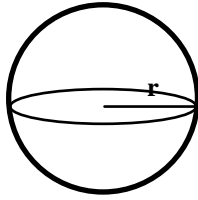
$$c^2 = a^2 + b^2$$

## Circle



$$\text{Area} = \pi r^2$$
$$\text{Circumference} = 2\pi r$$
$$\text{Diameter} = 2r$$

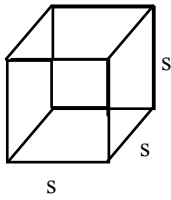
## Sphere



$$\text{Surface area} = 4 \pi r^2$$

$$\text{Volume} = \frac{4}{3} \pi r^3$$

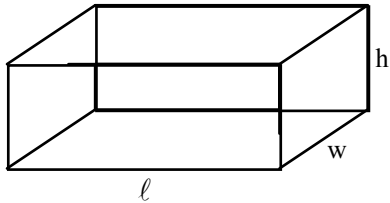
## Cube



$$\text{Surface area} = 6s^2$$

$$\text{Volume} = s^3$$

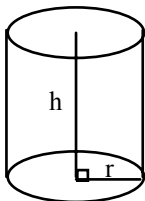
## Rectangular Solid



$$\text{Surface area} = 2\ell w + 2\ell h + 2wh$$

$$\text{Volume} = \ell wh$$

## Right Cylinder



$$\text{Surface area} = 2 \pi r h + 2 \pi r^2$$

$$\text{Volume} = \pi r^2 h$$