

# Mathematics 30-1

## Trigonometry I

$$\theta = \frac{a}{r}$$

$$\tan \theta = \frac{\sin \theta}{\cos \theta} \quad \cot \theta = \frac{1}{\tan \theta} = \frac{\cos \theta}{\sin \theta}$$

$$\csc \theta = \frac{1}{\sin \theta} \quad \sec \theta = \frac{1}{\cos \theta}$$

## Trigonometry II

$$\sin^2 \theta + \cos^2 \theta = 1$$

$$1 + \tan^2 \theta = \sec^2 \theta$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

$$\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$$

$$\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$$

$$\tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$$

$$\sin(2A) = 2 \sin A \cos A$$

$$\cos(2A) = \cos^2 A - \sin^2 A = 2 \cos^2 A - 1 = 1 - 2 \sin^2 A$$

$$\tan(2A) = \frac{2 \tan A}{1 - \tan^2 A}$$

## Transformations & Operations

$$y = af[b(x-h)] + k$$

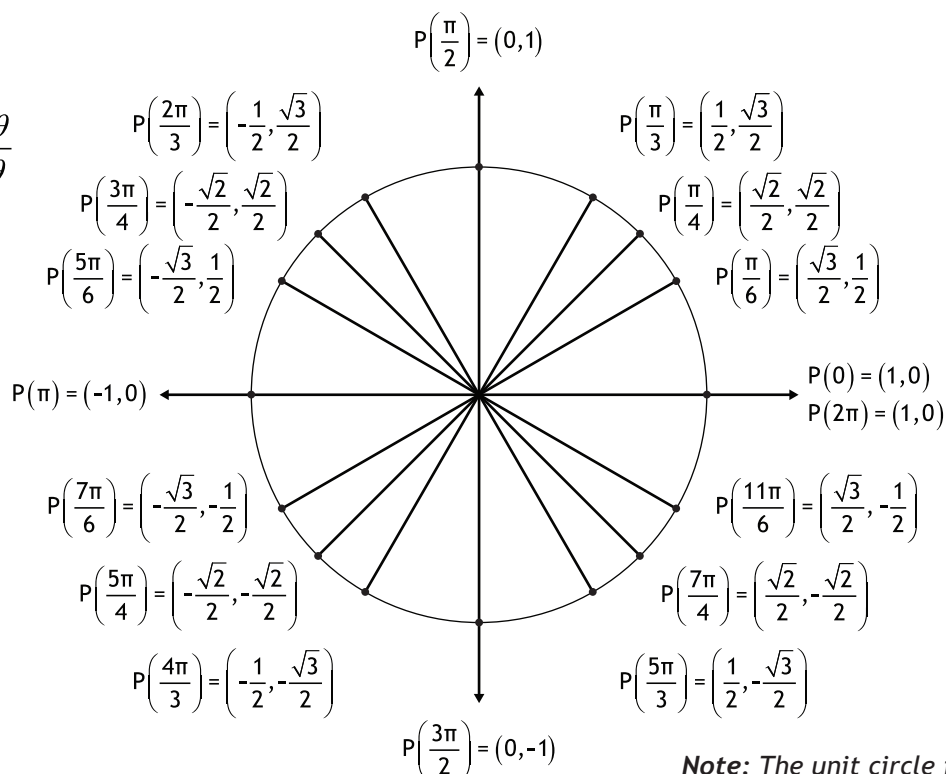
## Polynomial, Radical & Rational Functions

$$x : [x_{\min}, x_{\max}, x_{\text{scl}}]$$

$$y : [y_{\min}, y_{\max}, y_{\text{scl}}]$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

## The Unit Circle



*Note: The unit circle is NOT included on the official formula sheet.*

## Exponential and Logarithmic Functions

$$\log_b(M \times N) = \log_b M + \log_b N$$

$$\log_b\left(\frac{M}{N}\right) = \log_b M - \log_b N$$

$$\log_b(M^n) = n \log_b M$$

$$\log_b c = \frac{\log_a c}{\log_a b}$$

$$y = ab^{\frac{t}{p}}$$

## Permutations & Combinations

$$n! = n(n-1)(n-2)\dots 3 \times 2 \times 1$$

$${}_n P_r = \frac{n!}{(n-r)!}$$

$${}_n C_r = \binom{n}{r} = \frac{n!}{(n-r)!r!}$$

$$t_{k+1} = {}_n C_k x^{n-k} y^k$$

### Curriculum Alignment

Math 30-1: Alberta | Northwest Territories | Nunavut  
 Pre-Calculus 12: British Columbia | Yukon  
 Pre-Calculus 30: Saskatchewan  
 Pre-Calculus 40S: Manitoba

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## Table of Contents

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<b>Unit 1: Polynomial, Radical, and Rational Functions</b>	<b>7:45 (16 days)</b>
Lesson 1: Polynomial Functions	1:38 (3 days)
Lesson 2: Polynomial Division	1:29 (3 days)
Lesson 3: Polynomial Factoring	1:13 (3 days)
Lesson 4: Radical Functions	0:52 (2 days)
Lesson 5: Rational Functions I	1:00 (2 days)
Lesson 6: Rational Functions II	1:33 (3 days)
<b>Unit 2: Transformations and Operations</b>	<b>4:38 (11 days)</b>
Lesson 1: Basic Transformations	0:57 (2 days)
Lesson 2: Combined Transformations	0:50 (2 days)
Lesson 3: Inverses	0:42 (2 days)
Lesson 4: Function Operations	0:48 (2 days)
Lesson 5: Function Composition	1:21 (3 days)
<b>Unit 3: Exponential and Logarithmic Functions</b>	<b>5:55 (12 days)</b>
Lesson 1: Exponential Functions	1:52 (4 days)
Lesson 2: Laws of Logarithms	2:11 (4 days)
Lesson 3: Logarithmic Functions	1:52 (4 days)
<b>Unit 4: Trigonometry I</b>	<b>9:59 (17 days)</b>
Lesson 1: Degrees and Radians	2:22 (4 days)
Lesson 2: The Unit Circle	2:15 (4 days)
Lesson 3: Trigonometric Functions I	2:24 (5 days)
Lesson 4: Trigonometric Functions II	1:58 (4 days)
<b>Unit 5: Trigonometry II</b>	<b>7:05 (12 days)</b>
Lesson 5: Trigonometric Equations	2:12 (4 days)
Lesson 6: Trigonometric Identities I	2:34 (4 days)
Lesson 7: Trigonometric Identities II	2:19 (4 days)
<b>Unit 6: Permutations and Combinations</b>	<b>4:57 (10 days)</b>
Lesson 1: Permutations	2:00 (4 days)
Lesson 2: Combinations	1:56 (4 days)
Lesson 3: The Binomial Theorem	1:01 (2 days)
<b>Total Course</b>	<b>40:19 (78 days)</b>