# Test #1b Concepts Review

**Graphing Sinusoids**

Sine, Cosine, Tangent } w/ translations

Cotangent, Secant, Cosecant } recognize & graph basic

Inverse Sine, Cosine & Tangent } recognize & graph basic

**Radian Measure**

Degree ↔ Radians

$\theta = {}^{s}/_{r}$ & $s = \theta r$

**Arc Length Relationships**

Area of Sector

$A = {}^{1}/_{2}\, r^2\, \theta$

Angular Speed

$\omega = {}^{\theta}/_{t}$

Linear Speed

$v = {}^{s}/_{t} = r\omega$

**Trig Ratio Reviewed**

Definitions

In Terms of x, y & r

✓ $\frac{y}{r}, \frac{x}{r}, \frac{y}{x}, \frac{x}{y}, \frac{r}{x}, \frac{r}{y}$

In Terms of opposite, adjacent & hypotenuse

✓ $\frac{opp}{hyp}, \frac{adj}{hyp}, \frac{opp}{adj}, \frac{adj}{opp}, \frac{hyp}{adj}, \frac{hyp}{opp}$

Reciprocal Identities

$\frac{1}{csc}, \frac{1}{sec}, \frac{1}{cot}, \frac{1}{tan}, \frac{1}{cos}, \frac{1}{sin}$

Quotient Identities (your book makes a distinction here with reciprocal identities)

$\frac{\sin t}{\cos t} = \tan t, \quad \frac{\cos t}{\sin t} = \cot t$

Signs in 4 Quadrants

**A**ll **S**tudents **T**ake **C**alculus to remember which positive

QI (+, +), QII (–, +), QIII (–, –), QIV (+, –) and therefore in QI all ${}^{+}/_{+} = +$, in QII anything involving y will be negative and while all else will be positive (see def. in terms of x, y & r), in QIII anything involving x or y will be negative & only those involving both x & y will be positive, in QIV anything involving y will be negative

Ratios of 2 Special Right Triangles

30/60/90 ratio of sides $1:\sqrt{3}:2$

45/45/90 ratio of sides $1:1:\sqrt{2}$

sin, cos, tan, cot, sec, csc in terms of opp/hyp/adj using ratios

Pythagorean Identities

$\sin^2 t + \cos^2 t = 1, \tan^2 t + 1 = \sec^2 t, 1 + \cot^2 t = \csc^2 t$

**Solving Triangles**

By Methods of

Trig Ratios to get exact values (no calculator/approximation)

Pythagorean Identities to get exact values (no calculator/approximation)

Inverse f(n) to get the angles based on known exact ratios

Also to get approximate values (calculator exercises)

Using each of the following in assisting

Reference Angles

Coterminal Angles

Sign Information from quadrants

**Solving Triangles that ARE NOT right Δ's**

Law of Sines

Case 1: ASA or SAA (2 angles & side included or not)

Case 2: SSA – the ambiguous case

If $\sin\theta > 1$ then DNE

If $\sin\theta < 1$ then be sure to check $180 - \theta$

Law of Cosines

Case 3: SAS (included angle between 2 sides)

Case 4: SSS

*No Ambiguity in Law of Cosines!*

**Heron's Formula for Oblique Δ**

$A = \sqrt{s(s-a)(s-b)(s-c)}$ where $s = {}^1/_2(a+b+c)$ called the half-perimeter

**Extras Related to Solving Triangles**

Bearing

Angles of Elevation

To Prepare for Test

From Edition 6

Do Ch. 6 Test on p. 487 (#23 & 24 have no comp in Ed 5) &

Ch 6 Review on p. 483

From Edition 5

Do Ch. 6 Test on p. 520 & Review on p. 516

Do Ch. 7 Test p. 574 #8 & 11

Do Ch. 7 Review p. 572 #65, 66, 69, 70 & #73-76all

In Addition Ed. 6 asks to solve triangles with the following:

| | |
|---|---|
| #73 in ed 6 p. 486 | Find A when a = 23, C = 25º, c = 12 |
| #74 in ed 6 p. 486 | Find A when a = 4, C = 80º, c = 5 |
| #75 in ed 6 p. 486 | Find B when b = 120, a = 85, c = 100 |
| #76 in ed 6 p. 486 | Find B when C = 10º, c = 3, a = 5 |
| #17 in ed 6 p. 487 | Find C when a = 6, b = 8, c = 9 |
| #18 in ed 6 p. 487 | Find C when B = 75º, a = 7, c = 5 |

From Ch. 5 make sure you can graph still!!