

Math 112 – Outline of topics for Test 3, Fall 2007

Section 7.7 & 7.8 Solving trigonometric equations.

Do Chapter 7 Review # 77-99 & 107-109 and Chapter 7 Test page 768 # 29 & 30.

- Solve simple equations with a single function; solve for exact values and with a calculator for approximate decimal values.
- Solve equation where it is necessary to use algebra to simplify and isolate the trig function before finding the unknown angle.
- Solve an equation involving 2θ or $\theta/2$.
- Solve an equation where it is necessary to use an identity while simplifying it.
- Solve an equation by graphing on the calculator and finding where two graphs intersect or finding x-intercepts if equation = 0.

Please practice by doing the Chapter 8 Test on pages 814-815 #1-16 and Chapter 8 Review page 811 #21.

Section 8.1 Applications involving right triangles

Solve for missing sides or angles in a right triangle using the definitions of trig functions.
(Review sections 6.2-6.3)

Section 8.2 Solve for missing sides or angles in a triangle that may NOT be a right triangle, using the **Law of Sines**. See page 778 for the four cases that outline when to use the law of sines and when to use the law of cosines. Notice that in the proportion the sine of an angle is compared to the side opposite that angle. When solving for an angle with the law of sines, remember to consider that the angle could be acute or obtuse.

$$\frac{\sin \alpha}{a} = \frac{\sin \beta}{b} = \frac{\sin \gamma}{c}$$

Section 8.3 Solve for missing sides or angles in a triangle that may NOT be a right triangle, using the **Law of Cosines**. “The square of one side of a triangle equals the sum of the squares of the other two sides minus twice their product times the cosine of their included angle.”

Example: $c^2 = a^2 + b^2 - 2ab \cos \gamma$

- SAS: When you are given two sides and the included angle and are asked to “solve the triangle”, you should find the 3rd side first and then find the angles.
- SSS: When you are given all three sides and are asked to “solve the triangle”, you should find the angle opposite the largest side first.

Section 8.4 Area of a triangle

- Find the area of a triangle given SAS or SSS.
- For SAS: Area = $\frac{1}{2}$ the product of two sides times the sine of the included angle.

$$A = \frac{1}{2} (\text{side}_1)(\text{side}_2)(\text{sine of included angle}).$$

Example: $A = \frac{1}{2} ab \sin \gamma$

- For SSS use Heron’s formula:

$$A = \sqrt{s(s-a)(s-b)(s-c)}, \text{ where } s = \frac{a+b+c}{2}$$

Section 8.5 Simple Harmonic Motion; Damped Motion; Combining Waves

- Simple Harmonic Motion: $d = a \cos(\omega t)$ or $d = a \sin(\omega t)$
- Damped Motion (see equation page 805)
- Combining Waves – graphing the sum of two sinusoidal functions