Course Review

Chapter 7 - Applications of Trig Functions

7-1 Right Triangle Trigonometry

Angle of Elevation: measure upward with respect to the horizon
Angle of Depression: measure downward with respect to the horizon
Navigational Angle: measure with respect to NORTH; positive direction is clockwise
Surveying/Bearing Angle: the acute angle at which direction varies east/west from north/south

$\sin(\theta) = \frac{\text{opposite}}{\text{hypotenuse}}$ or $\frac{y}{r}$ $\quad\quad$ $\cos(\theta) = \frac{\text{adjacent}}{\text{hypotenuse}}$ or $\frac{x}{r}$ $\quad\quad$ $\tan(\theta) = \frac{\text{opposite}}{\text{adjacent}}$ or $\frac{y}{x}$

7-2 Law of Sines

$\frac{\sin(A)}{a} = \frac{\sin(B)}{b} = \frac{\sin(C)}{c}$ $\quad\quad$ When to use: ASA, AAS, SSA

Ambiguous Case of Sine Law: when given two side and a **non-included angle**.
Possible solutions: 1 (exactly one right-triangle), 2 (solution *and* 180° - solution), or none (too short).

7-3 Law of Cosines

$c^2 = a^2 + b^2 - 2ab \cdot \cos(C)$ $\quad\quad$ When to use: SAS, SSS

7-4 Area of a Triangle

$K = \frac{1}{2}\, a \cdot b \cdot \sin(C)$ $\quad\quad$ When to use: SAS

$A = \sqrt{[s \cdot (s-a) \cdot (s-b) \cdot (s-c)]}$; where $s = \frac{1}{2}\,(a+b+c)$ $\quad\quad$ When to use: SSS

(Heron's Formula)