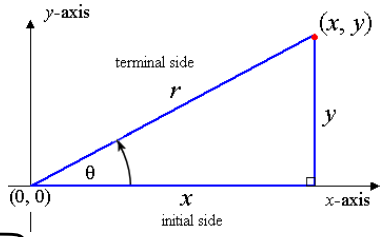
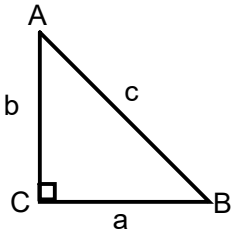
Tuesday, September 4, 2018

Chapter 6 - Introduction to Vectors



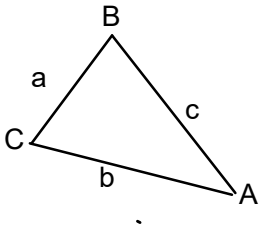
Trignometry Review

1) Right Triangles



- You can use SOH CAH TOA or x, y, and r (sin = y/r, cos = x/r, and tan = y/x), depending on the situation.
- Sine and Cosine are always less than one. Why?
  - the larger side (hypotenuse or 'r') is always on the bottom of the ratio, and it is always the longest side

2) Non-Right Triangles



- Remember that the smallest side is opposite the smallest angle and the largest side is opposite the largest angle.
- What is the formula for the Sine Law?

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

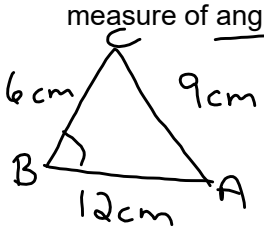
- What is the formula for the Cosine Law?

$$a^2 = b^2 + c^2 - 2bc\cos A$$

$$\cos A = \frac{a^2 - b^2 - c^2}{-2bc}$$

3) Practice Problems

In triangle ABC, a = 6 cm, b = 9 cm, and c = 12 cm. Determine the measure of angle B to the nearest degree.



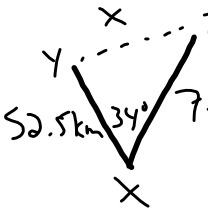
$$\cos B = \frac{9^2 - 6^2 - 12^2}{-2(6)(12)}$$

$$B = \cos^{-1}\left(\frac{99}{144}\right)$$

$$= 47°$$

Two cars depart from an intersection at the same time. The angle between them is 34°, and one car travels at 100 km/h while the other travels at 70 km/h. How far apart at the cars after 45 minutes?

Let x be the distance between the cars.



$$d = s \times t$$

$$= 100 \times \frac{3}{4}\ \text{km/h}\ \text{h}$$

$$x^2 = 75^2 + 52.5^2 - 2(75)(52.5)\cos 34°$$

$$\sqrt{x^2} = \sqrt{1852.58}$$

$$x = 43\ \text{km}$$

∴ They are 43 km apart.