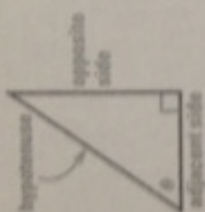


Notes: 9.1 Right Triangle Trigonometry

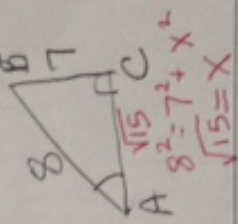
Let θ be an acute angle of a right triangle. The six trigonometric functions of θ are defined as follows:

$\sin \theta = \frac{\text{opp.}}{\text{hyp.}}$ cosecant $\frac{\text{hyp.}}{\text{opp.}}$
 $\cos \theta = \frac{\text{adj.}}{\text{hyp.}}$ secant $\frac{\text{hyp.}}{\text{adj.}}$
 $\tan \theta = \frac{\text{opp.}}{\text{adj.}}$ cotangent $\frac{\text{adj.}}{\text{opp.}}$



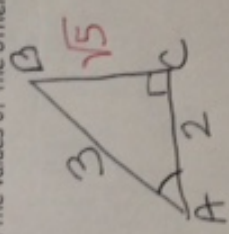
Notes: $\csc \theta = \frac{1}{\sin \theta}$ $\sec \theta = \frac{1}{\cos \theta}$ $\cot \theta = \frac{1}{\tan \theta}$

Example 1: Given $\triangle ABC$ with $m\angle C = 90^\circ$, $AB = 8$, and $BC = 7$. Evaluate the six trigonometric functions of $\angle A$.



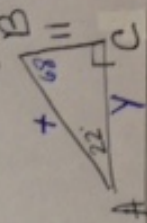
$\sin A = \frac{7}{8}$ $\csc A = \frac{8}{7}$
 $\cos A = \frac{\sqrt{15}}{8}$ $\sec A = \frac{8}{\sqrt{15}}$
 $\tan A = \frac{7}{\sqrt{15}}$ $\cot A = \frac{\sqrt{15}}{7}$

Example 2: Given $\triangle ABC$ with $m\angle C = 90^\circ$, and $\cos A = 2/3$. Find the values of the other 5 trig functions.



$\sin A = \frac{\sqrt{5}}{3}$ $\csc A = \frac{3}{\sqrt{5}} = \frac{3\sqrt{5}}{5}$
 $\tan A = \frac{\sqrt{5}}{2}$ $\sec A = \frac{3}{2}$
 $\cot A = \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$

Example 3: Given $\triangle ABC$ with $m\angle C = 90^\circ$, $m\angle A = 22^\circ$, and $BC = 11$. Solve the triangle (find the two missing sides and the missing angle).



$\sin 22 = \frac{11}{x}$ $\tan 22 = \frac{y}{11}$
 $x = \frac{11}{\sin 22} = 29.36$ $27.23 = y$