

[trigonometry review]

1. Given $\triangle ABC$ with $AC = 17$, $BC = 15$, and $\angle ABC = 90^\circ$, determine
 - a. Side C
 - b. $\angle A$
 - c. $\angle C$
2. Solve $\triangle PQR$ with $r = 3.2$, $p = 1.7$, $\angle Q = 67^\circ$
3. Prove each of the following is an identity:
 - a. $\frac{\csc \theta}{\sec \theta} \sin \theta = \frac{\cot \theta}{\csc \theta}$
 - b. $\csc^2 \theta + \sec^2 \theta = \frac{\csc \theta}{\cos \theta} \times \frac{\sec \theta}{\sin \theta}$
 - c. $\frac{\sin^2 x - \cos^2 x}{\sin x - \cos x} = \frac{\cos^2 x}{1 - \sin x} - 1 + \cos x$
4. Solve for θ :
 - a. $2 \cos^2 \theta + \cos \theta = 0, -2\pi \leq \theta \leq 2\pi$
 - b. $\cos \theta = -1, \theta \in \mathbb{R}$
 - c. $(5 \cos \theta - 4)(\cos \theta + 1) = 0, -360^\circ \leq \theta \leq 360^\circ$
 - d. $\sin \theta = -3$
 - e. $\cos 2\theta = -\frac{1}{\sqrt{2}}, -2\pi \leq \theta \leq \frac{\pi}{2}$
5. An eagle flying at a height of 500m directly overhead of QEP is moving at a constant speed of 4km/h. In 10 minutes time, what will be the angle of elevation of the eagle?
6. From the top of a 78 m building, the angle of depression to a car on the ground is 24° . From a minivan on the ground, on the same side of the building as the car, the angle of elevation to the top of the building is 70° . Find the distance between the car and the minivan. (Do not use the Sine law or Cosine law to solve.)
7. On one side of a river, a canoe and a motorboat are 120 m apart and a dock is on the other side of the river, forming a triangle. The angle at the canoe is 34° , while the angle at the motorboat is 42° . How far is the dock from the canoe?
8. At a moment in time, two eagles flying at the same altitude spotted a mouse in the field. One eagle was 48m from the mouse and the other was 110m from the mouse. If the mouse turned his head to look from one eagle to the other he would have had to turn it 105° . How far apart are the eagles?