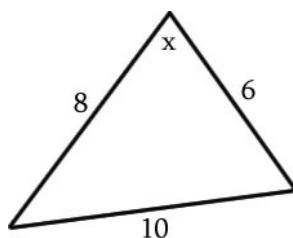

[10] 1. Find *all* solutions for x : $2 \sin^3 x + \sin^2 x - \sin x = 0$.

[5] 2. Simplify: $\frac{\sin x \cos^2 x + \sin^3 x}{\cos x}$

[10] 3. Verify the identity: $\frac{\csc x - \sec x}{\sec x \csc x} = \cos x - \sin x$

[15] 4. Use the figure below to answer parts (A) and (B).



(A) Find the measure of angle x .

(B) Find the area of the triangle.

[10] 5. Use an angle-sum or angle-subtraction formula to find $\sin \frac{5\pi}{12}$.

[10] 6. Use a formula for lowering powers to rewrite the expression in terms of the first power of cosine: $\cos^2 x \sin^2 x$.

[10] 7. You are standing on the ground looking up at an eagle's nest at the top of a tree. You are 20 feet from the base of the tree, and the angle of elevation is 60° . What is the height of the tree?

[10] 8. Suppose that a triangle has all three sides of length 5. Use the law of cosines to show that the angles of the triangle are all 60° .

[10] 9. Suppose that triangle ABC has angle $A = 10^\circ$, side $b = 100$, and side $a = 34$. Given that $\sin 10^\circ \approx .17$, how many triangles are there with this property? Use the law of sines to back up your answer. *Hint: find the measurement of angle B.*

[5] 10. If $\sin x = \frac{-1}{3}$ and x is in Quadrant IV, find $\sin 2x$.

[5] 11. Find $\tan(\sin^{-1}(\frac{4}{5}))$.
