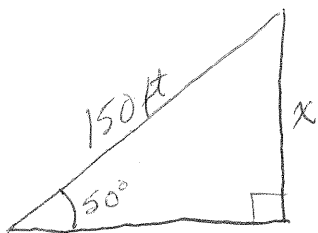


1. Two boys are flying a kite. The string attached to the kite is 150ft long when stretched fully. (5pts)

a) If the boys sight the angle of elevation at 50 degrees. How high is the kite?



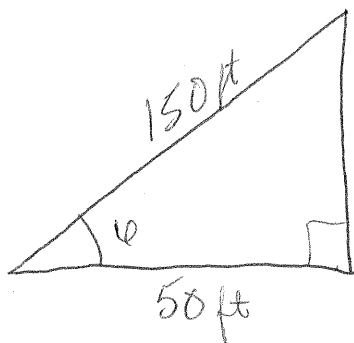
$$\sin(50^\circ) = \frac{x}{150}$$

$$x = 150 \sin(50^\circ)$$

$$x \approx 114.906666 \text{ ft}$$

115ft

b) Later, one of the boys measures the distance from the first boy to directly beneath the kite as 50ft. What is the angle of ascension to the kite? (Angle of elevation)



$$\cos(\phi) = \frac{50}{150}$$

$$\phi = \arccos\left(\frac{1}{3}\right)$$

$$\phi \approx 70.53^\circ$$

$$\text{or } 1.230959 \text{ radians}$$

70.53°

2. Simplify the following expressions and circle the letter of the expression it matches. You must show some work. (5pts)

$$\text{a) } \frac{\cos^2 \alpha - 1}{\cos \alpha - 1} = \frac{(\cos^2 \alpha - 1)(\cos \alpha + 1)}{(\cos \alpha - 1)(\cos \alpha + 1)} = \frac{(\cos^2 \alpha - 1)(\cos \alpha + 1)}{(\cos^2 \alpha - 1)} = \cos \alpha + 1$$

A. $\cos \alpha - 1$

B. $\sec \alpha + 1$

C. $\cos \alpha + 1$

D. $\frac{\sin^2 \alpha}{\cos \alpha - 1}$

E. None of the before

$$\text{b) } \tan x \sec^2 x - \tan x = \tan(x)(\sec^2 x - 1) = \tan^3(x)$$

A. 1

B. $\cot x$

C. $\tan^3 x$

D. $\frac{\sin x}{\cos^3 x}$

E. None of the before