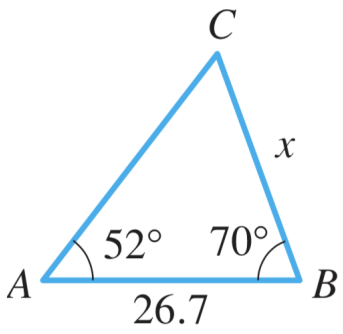
Exam 4 Study Guide :: Math 115 :: November 30, 2018

1. **Solve the triangle**



2. **Trigonometric Equations**
   Solve

$$4\cos^2\theta - 13\cos\theta + 3 = 0$$

3. **Trigonometric Identities**

Verify

$$\sec^4 x - \tan^4 x = \sec^2 x + \tan^2 x$$

Verify

$$\frac{\cos\theta}{1-\sin\theta} = \sec\theta + \tan\theta$$

Verify

$$(\sin x - \tan x)(\cos x - \cot x) = (\cos x - 1)(\sin x - 1)$$

Verify

$$\frac{\sin x + \cos x}{\sec x + \csc x} = \sin x \cos x$$

Verify

$$\tan^2 u - \sin^2 u = \tan^2 u \sin^2 u$$

Verify

$$\cos(-x) - \sin(-x) = \cos x + \sin x$$

Verify

$$\sin(x - \pi) = -\sin(x)$$

Verify

$$\sin(x-y)\sin(x+y) = (\sin(x) - \sin(y))(\sin(x) + \sin(y))$$

Verify

$$\cos(x+y)\cos(x-y) = \cos^2 x - \sin^2(y)$$

4. Compute $\sin(15°)$ exactly (Hint: use a half-angle formula.)

5. Compute $\cos(22.5°)$ exactly.

6. Compute $\cos(75°)$ exactly.

7. Find the shortest distance across the river as shown in the figure.