

Math 196L Spring 2017

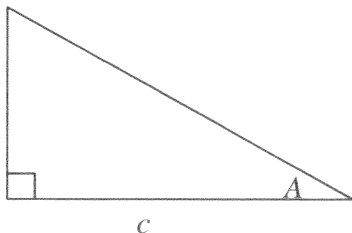
This week the assignment will be in two parts with instructions as follows:

Part 1: Read each problem. Write a sentence or two about the approach you might take to solve each problem. Draw a picture to illustrate the scenario. Write a formula that might be needed to help set up or solve the problem.

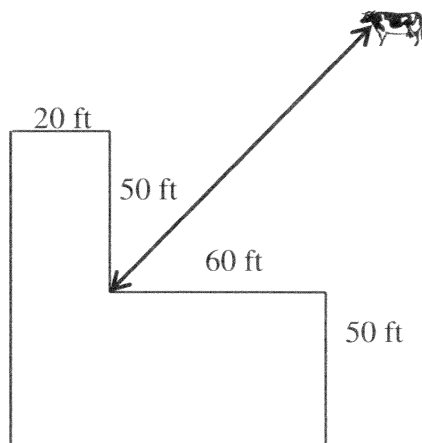
Part 2: You do not need to attempt these problems prior to class. These problems will be attempted with your group during our class.

Part 1:

1. The world's tallest Ferris wheel is the Singapore Flyer, with a height of 165 meters. It rotates slowly at a constant rate so passengers can get off and on without stopping the wheel, one full revolution taking 37 minutes.
 - (A) Suppose you enter a capsule of the Ferris wheel at the bottom, a height of 2 meters off the ground from a platform. Find a formula for your height t minutes after boarding.
 - (B) If we approximate a non-fatal height to fall from is 3 meters (approximately the height of a one story house), during what time intervals in the first rotation would it be "safe" to fall from the Ferris wheel capsule.
 - (C) What would happen to these time intervals if the wheel malfunctioned and spun twice as quickly? What are the times you can jump during one rotation?
2. Given the triangle below, write the area and perimeter of this triangle, using only the indicated letters.



3. A cow is tethered by a 100 ft. rope to the inside corner of an L-shaped building as shown in the figure. Find the area that the cow can graze.



Part 2:

4. Suppose $\cos \theta = b$ where $0 < b < 1$, b is a constant, and $\frac{3\pi}{2} < \theta < 2\pi$.

Determine the following in terms of b :

- (A) $\sin \theta$ (B) $\tan \theta$
 (C) $\cos(-\theta)$ (D) $\sin(-\theta)$
 (E) $\sin(\theta + \pi)$ (F) $\sin\left(\theta + \frac{\pi}{2}\right)$
5. The $\tan(\theta) = \frac{6}{7}$ write the 6 trig functions for this angle θ .

6. Evaluate the following without finding the actual angle value:

- (A) $\cos(\sin^{-1}(-\frac{1}{2}))$
 (B) $\csc(\arctan(\sqrt{3}))$
 (C) $\sin(\arcsin(-3))$
 (D) $\sec(\tan^{-1}(x))$
 (E) $\tan\left(\cos^{-1}\left(\frac{3}{x}\right)\right)$