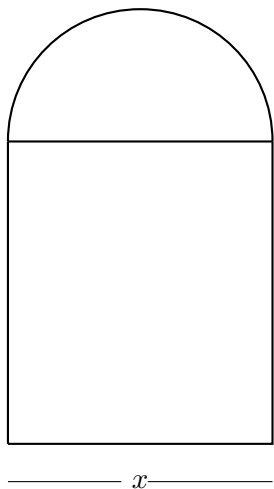Math 29
PAL Worksheet 15

1. A Norman window has the shape of a semicircle on top of a rectangle. If the perimeter of the window is 30 feet, express the area A of the window as a function of the width x of the window.

x

2. Use the laws of logarithms to find the value of each expression given that $\log_a x = 10$, $\log_a y = 12$, and $\log_a z = 21$.

a. $\log_a(xy)$

b. $\log_a \left(\dfrac{y}{z} \right)$

c. $\log_a(xy^2)$

d. $\log_a \sqrt[3]{y}$

e. $\log_a \left(\dfrac{x^2 y^3}{\sqrt{z}} \right)$

3. If $\log_5 11 = u$ and $\log_5 9 = v$, express each of the following in terms of u and v.

a. $\log_5(99)$

b. $\log_5 \left(\dfrac{121}{9} \right)$

c. $\log_5(3)$

d. $\log_5 \sqrt{33}$

e. $\log_5 \left(\dfrac{1}{55} \right)$

f. $\log_5(45)$