Math 27, HW #5 Selected Problems

Pg. 25, #26 Note that $x + y^2 = 3 \Rightarrow y^2 = 3 - x \Rightarrow y = \pm\sqrt{3-x}$

For every $x \le 3$, there are two values of y.

The equation does not represent y as a function of x.

Pg. 25, #36 $\boxed{f(x) = \sqrt{x+8} + 2}$

a) $f(-4) = \sqrt{-4+8} + 2 = \sqrt{4} + 2 = \boxed{4}$

b) $f(8) = \sqrt{8+8} + 2 = \sqrt{16} + 2 = \boxed{6}$

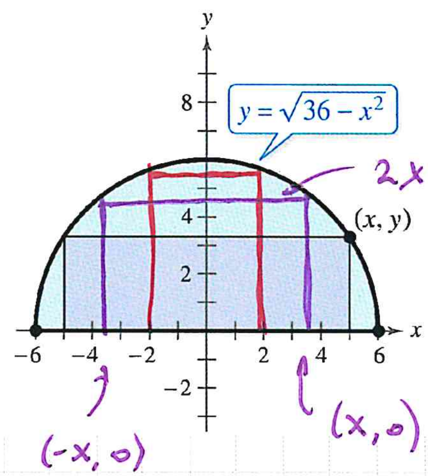
c) $f(x-8) = \sqrt{(x-8)+8} + 2 = \boxed{\sqrt{x} + 2}$

Pg. 25, #66 $f(x) = \dfrac{\sqrt{x+6}}{6+x}$ $\qquad x + 6 < 0 \Rightarrow x < -6$

Note that when $x = -6$ we have division by 0, and f is not defined. Also, when $x < -6$ we have $x + 6 < 0$ and f will involve the square root of a negative number. Thus the domain of f is all real numbers greater than -6. Domain: $\boxed{x > -6}$

Pg. 26, #75

75. Geometry A rectangle is bounded by the x-axis and the semicircle $y = \sqrt{36 - x^2}$, as shown in the figure. Write the area A of the rectangle as a function of x and determine the domain of the function.



Recall: Area of rectangle = $\ell \cdot w$

So, $A = 2x \cdot y = 2x\sqrt{36-x^2}$

Since area is positive $x > 0$

For $\sqrt{36-x^2}$ to be a real number

The domain of $A(x)$ is: $0 < x < 6$

Pg. 28, #85 $\boxed{f(x) = x^2 - x + 1}$

Find: $\dfrac{f(2+h) - f(2)}{h} = \dfrac{(2+h)^2 - (2+h) + 1 - (2^2 - 2 + 1)}{h}$

$= \dfrac{\cancel{4} + 4h + h^2 \cancel{-2} - h \cancel{+1} \cancel{-3}}{h}$

$= \dfrac{3h + h^2}{h}$

$= \dfrac{\cancel{h}(3+h)}{\cancel{h}} = \boxed{3 + h}$