

Math 16A (Summer 2010)  
Kouba  
Quiz 1

KEY

PRINT Name : \_\_\_\_\_

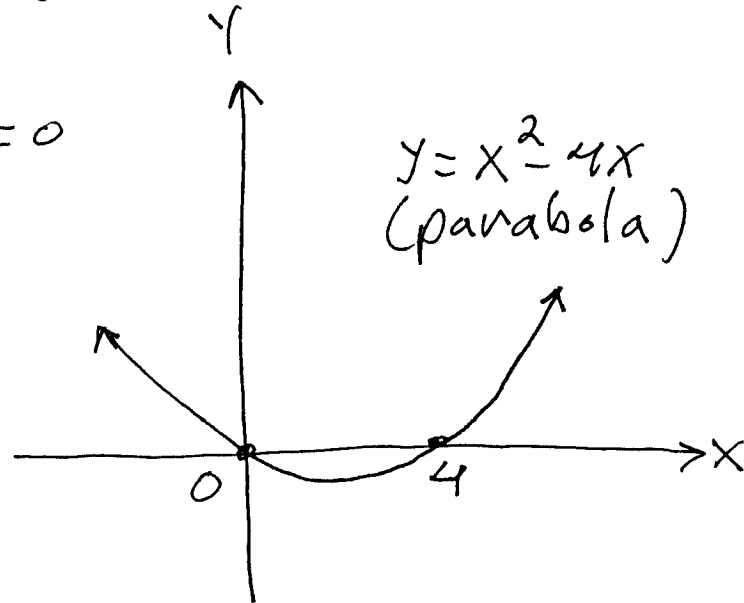
Exam ID # : \_\_\_\_\_

1.) (10 pts.) Determine the x- and y-intercepts for  $y = x^2 - 4x$ . Then sketch the graph of this equation using appropriate labeling of your diagram.

$$x=0 : y=0$$

$$y=0 : x^2 - 4x = x(x-4) = 0$$

$$\rightarrow x=0, x=4$$



2.) (10 pts.) Determine the center and radius of the circle given by :  $x^2 + y^2 + 2y = 2x + 7$

$$\rightarrow x^2 - 2x + y^2 + 2y = 7$$

$$\rightarrow (x^2 - 2x + 1) + (y^2 + 2y + 1) = 7 + 1 + 1 = 9$$

$$\rightarrow (x-1)^2 + (y+1)^2 = 3^2$$

$$\rightarrow \text{radius } r = 3, \text{ center } (1, -1)$$

3.) (10 pts.) Find an equation of the line in slope/intercept form ( $y = mx + b$ ) passing through the point  $(2, -3)$  and which is parallel to the line  $x + 2y = 4$ .

$$x + 2y = 4 \rightarrow 2y = -x + 4 \rightarrow y = -\frac{1}{2}x + 2 \rightarrow$$

slope  $m = -\frac{1}{2}$  and pt.  $(2, -3)$  so line is

$$y - (-3) = -\frac{1}{2}(x - 2) \rightarrow y + 3 = -\frac{1}{2}x + 1 \rightarrow$$

$$y = -\frac{1}{2}x - 2$$

4.) (10 pts.) Let  $f(x) = \frac{2-x}{x+3}$  and  $g(x) = \frac{1}{x}$ . Find and simplify the functional composition  $f(g(x))$ .

$$f(g(x)) = f\left(\frac{1}{x}\right) = \frac{2 - \left(\frac{1}{x}\right)}{\left(\frac{1}{x}\right) + 3} \cdot \frac{x}{x} = \frac{2x - 1}{1 + 3x}$$

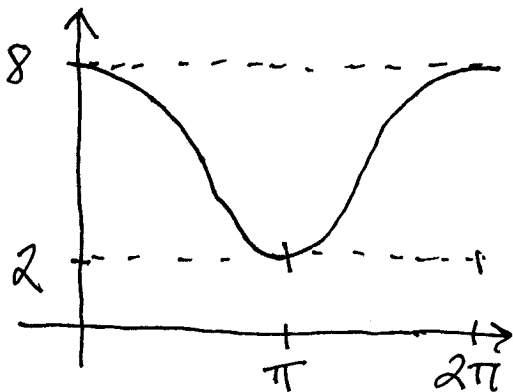
5.) a.) (5 pts.) Determine the domain of  $f(x) = \sqrt{7-3x}$ .

We need  $7 - 3x \geq 0 \rightarrow 7 \geq 3x \rightarrow$

Domain:  $x \leq \frac{7}{3}$

b.) (5 pts.) Determine the range of  $f(x) = 5 + 3\cos x$ .

Sketch graph:



Range:  $2 \leq y \leq 8$