



Respuestas sin procedimiento no tendrán puntaje. Escriba sus procedimientos y respuestas en el espacio dado. Usted tiene 45 minutos.

Nombre: \_\_\_\_\_ Curso: 110\_\_ Fecha: \_\_\_\_\_

1. Simplifique a su mínima expresión las siguientes expresiones:

a)  $3^2 \cdot 3^4 =$

b)  $\frac{6^7}{6^3} =$

c)  $(3^2)^5 =$

2. Use the  $\varepsilon$ - $\delta$  definition of limit to prove that

$$\lim_{x \rightarrow 2} x^2 - 3x + 2 = 0$$



3. If  $h(x) = \sqrt{x^2 + 2} - 1$ , find a **non-trivial** decomposition of  $h$  into  $f$  and  $g$  such that  $h = f \circ g$ .

$$f(x) = \underline{\hspace{10cm}}$$

$$g(x) = \underline{\hspace{10cm}}$$

4. Find the first two derivatives of the function  $f(x) = x^2 \cos(x)$ . Simplify your answers as much as possible. Show all your work.

$$f'(x) = \underline{\hspace{10cm}}$$

$$f''(x) = \underline{\hspace{10cm}}$$



5. Find the derivative of the function  $f(x) = \int_{x^2}^2 \frac{\cos(t)}{t} dt$ .

Answer:\_\_\_\_\_

6. Set up, but do not evaluate, the integral for the volume of the solid obtained by rotating the area between the curves  $y = x$  and  $y = \sqrt{x}$  about the  $x$ -axis.