Calculus 12 **LG 17/18 Test Version A** **/25**

Name:_____ Date:_____

1. Find the area of the region between the curves $y = x^2$ and $y = x + 6$ on the interval [0, 2]. (3 marks)

2. Find the area enclosed by the curves $x^2 = y$ and $x = y - 2$. (3 marks)

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3. Find a horizontal line $y = k$ that divides the area between $y = x^2$ and $y = 9$ into two equal parts. (3 marks)

4. The base of a certain solid is the region enclosed by $y = \sqrt{x}, y = 0$, and $x = 4$. Every cross section perpendicular to the x-axis is a square. Determine the volume. (3 marks)

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5. Find the volume of the solid that results when the region $y = \sqrt{x},\ y = 12 - x$, and $x = 0$ is revolved about the x-axis. (3 marks)

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6. Solve the differential equation: $\frac{dy}{dx} = \cos 2x$ (3 marks)

7. Solve the initial value problem. $\frac{dy}{dx} = y(1 - x^2), \;\; y(0) = 2$ (3 marks)

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8. In the year 2000, the population of a town was 12,000 people. Since then, the population of the town has been growing by 2% per year. Let $y = y(t)$ be the population of the town t years later.

a) Find a formula for $y(t)$. (2 marks)

b) When will the population of the town reach 20,000 people? (2 marks)

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