AB Calculus Q3 Concepts

1. **Indefinite Integrals**
    a. Derivative backwards
    b. U-substitution Process: (formulas on back)
        i. _____
        ii. _____
        iii. _____
        iv. _____
        v. _____
    c. Algebraic Methods
        i. _____
        ii. _____
        iii. _____
        iv. _____
        v. _____
        vi. _____

2. **Definite Integrals**
    a. Formal Definition: _____
    b. Informal Meaning: _____
    c. Properties: _____
    d. FTC: _____
    e. 2nd FTC: _____
    f. Average Value: _____
    g. Area between curves: _____
    h. Volume of Solids: _____
        i. With Squares: _____
        ii. With Equilateral Triangles: _____
        iii. With Rectangles: _____
        iv. With Right Triangles (legs): _____
        v. With Right Triangles (hypotenuse): _____
        vi. With Semicircles: _____
        vii. Of Revolution – always _____: _____
            1. Bounded by axis of revolution: _____
            2. Not bounded by axis or revolution: _____

3. **Differential Equations & Slope Fields**
    a. Separation of Variables Process
        i. _____
        ii. _____
        iii. _____
        iv. _____
        v. _____
    b. What does a slope field represent? _____

Integration Formulas:

$$\int u^n du =$$

$$\int u^{-1} du =$$

$$\int e^u du =$$

$$\int \sin u du =$$

$$\int \cos u du =$$

$$\int \sec^2 u du =$$

$$\int \sec u \tan u du =$$

$$\int \csc u \cot u du =$$

$$\int \csc^2 u du =$$

$$\int \frac{du}{a^2 + u^2} =$$

$$\int \frac{du}{\sqrt{a^2 - u^2}} =$$